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CONTENTS

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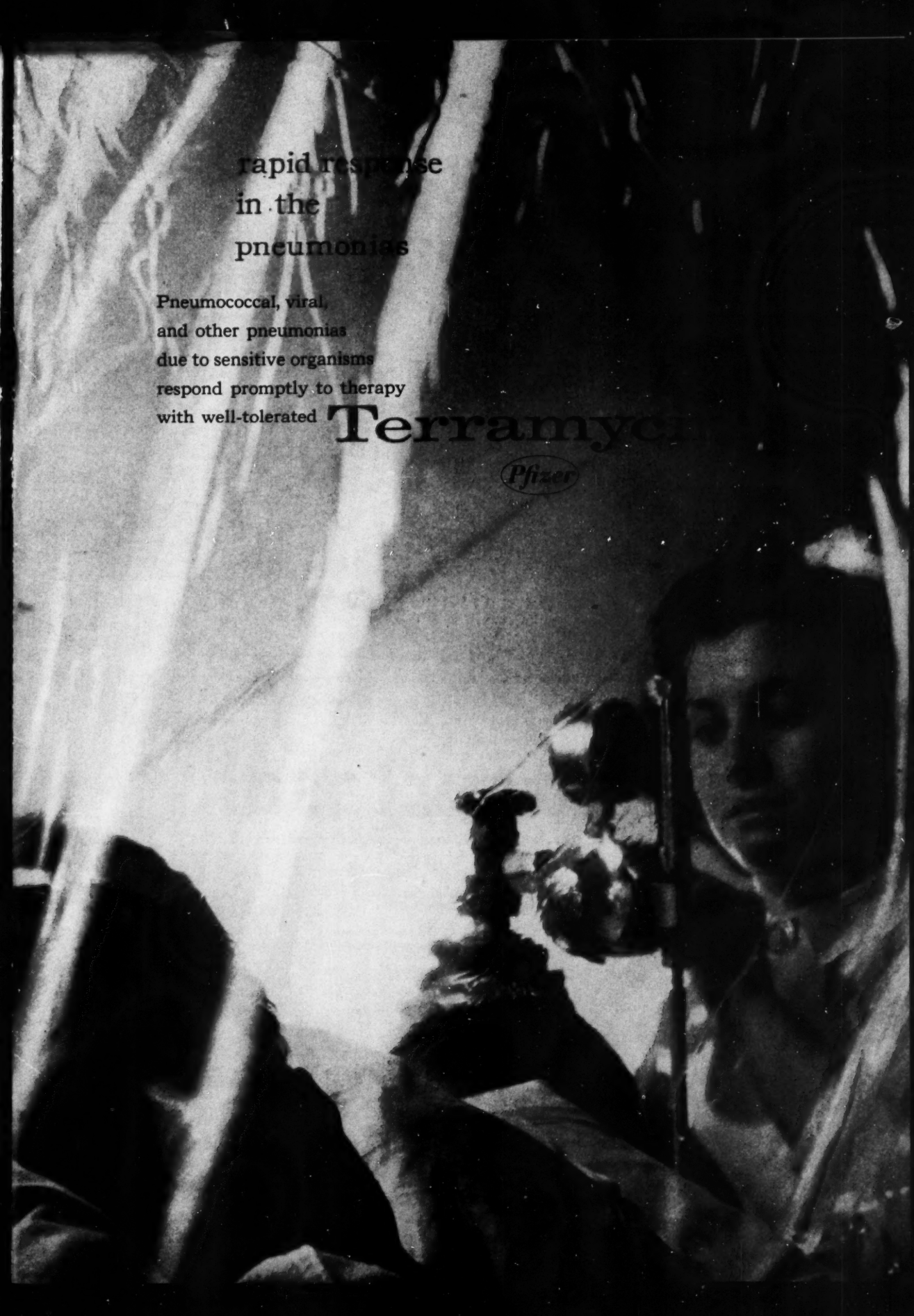
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1. Perloff, W. M.: Am. J. Obst. & Gynec. *58*:684, 1949.

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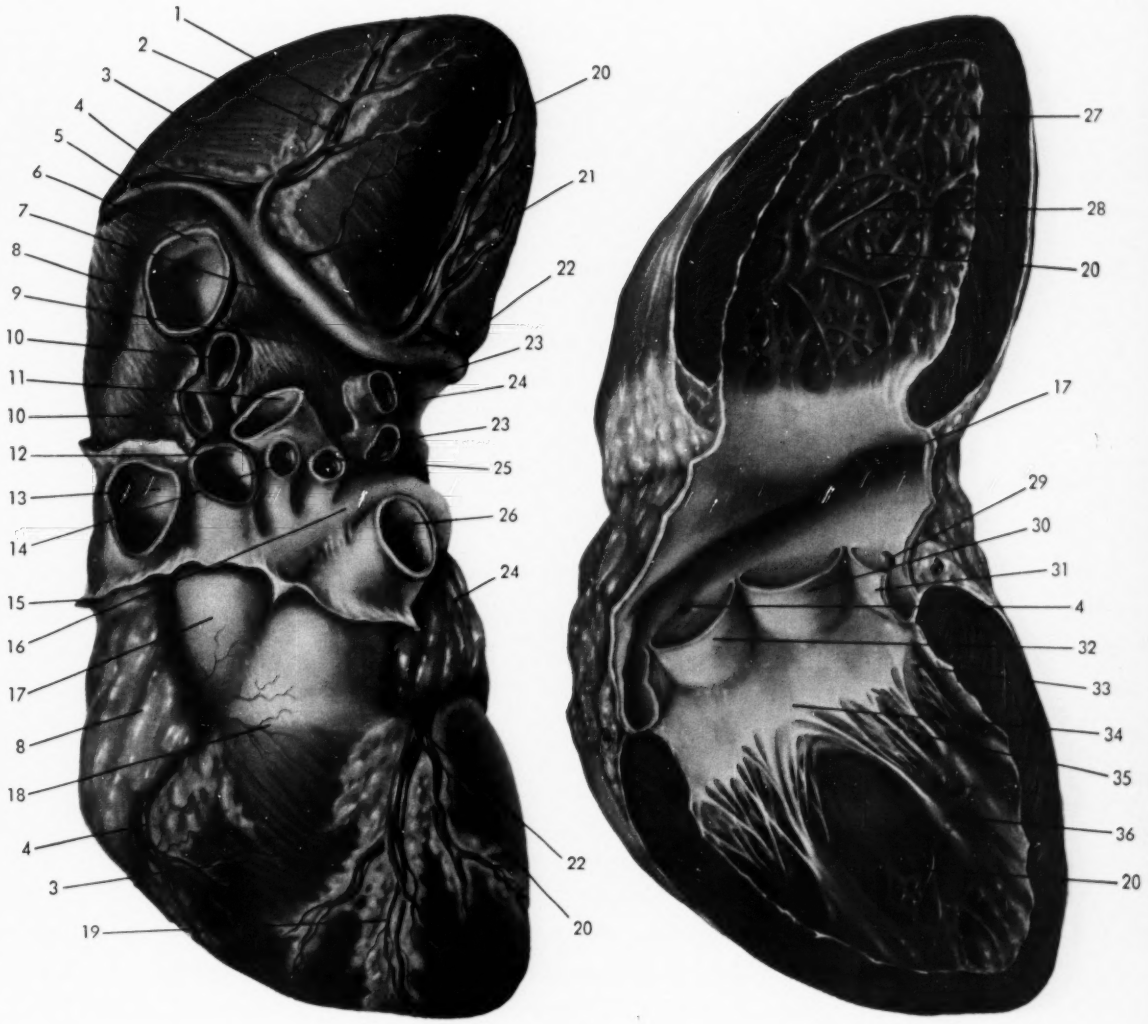
1. Reich, W. J., et al. (1952), A Recent Advance in Estrogen Therapy. II. Amer. J. Obst. & Gynec., 64:174, July. 2. Reich, W. J., et al. (1951), A Recent Advance in Estrogen Therapy. I. Amer. J. Obst. & Gynec., 62:427, August.

1-81

Anatomy *of the* Heart



1 Middle cardiac vein
2 Posterior descending branch of right coronary artery
3 Right ventricle
4 Right coronary artery
5 Small cardiac vein
6 Inferior vena cava
7 Coronary sinus
8 Right auricle
9 Left atrium
10 Right pulmonary vein
11 Right branch of pulmonary artery
12 Innominate artery
13 Superior vena cava
14 Left common carotid artery
15 Pericardium
16 Aortic arch
17 Ascending aorta
18 Conus arteriosus
19 Anterior descending branch of left coronary artery
20 Left ventricle
21 Posterior vein of left ventricle
22 Great cardiac vein
23 Left pulmonary vein
24 Left auricle
25 Left subclavian artery
26 Left branch of pulmonary artery
27 Trabeculae carneae
28 Trabecula tendinea
29 Left coronary artery
30 Posterior semilunar valve
31 Left semilunar valve
32 Right semilunar valve
33 Posterior cusp of mitral (bicuspid) valve
34 Anterior cusp of mitral (bicuspid) valve
35 Chordae tendineae
36 Papillary muscle

This is one of a series of paintings by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

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PERICARDITIS—The importance of aureomycin in pericarditis has been demonstrated by its successful use after failure of other therapy—in acute nonspecific pericarditis, possibly of viral etiology; *H. influenzae* pericarditis; tularemic pericarditis; and actinomycotic pericarditis.

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PERIODIC HEALTH EXAMINATIONS IN INDUSTRY

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I. INTRODUCTION

Experience has shown that a medical examination program in industry directed toward the best health interests of the employee proves to be beneficial both to the individual and to his company. There is no conflict of interests between employee and management in a properly conducted industrial health program.

In summary, the benefits to the employee are:

a) Affords early recognition of incipient disease.

b) Eliminates anxiety over trivial conditions; i.e., unimportant peculiarities of the individual worker which are without health import.

c) Protects against contagious disease at work.

d) Prevents the worker from being assigned to work which is too great for his physical abilities.

e) Protects against disease arising from occupation.

f) Promotes the correction of remediable physical defects.

g) Provides an opportunity for health education.

The employer finds these benefits from an adequate examination program:

a) Better employee morale and good will.

b) Reduction in the amount of time lost from work because of illness.

c) Increased efficiency in personnel.

d) Reduction in costs of benefit plans, group insurance and industrial compensation.

e) Better placement and less turnover of labor.

*Attending Chief, Division of Medicine, Delaware Hospital, Medical Director, Hercules Powder Company.

II. THE SELECTION OF AN EXAMINING PHYSICIAN

The examining physician should be one who has sincere interest in the use of the periodic health interview for health maintenance as well as for the early detection of disease. The ability to take a good medical history and a knowledge of the techniques of an adequate physical examination are essential. The physician should have a persuasive personality, one who can convince others of the worthwhileness of a given course of action. He should be of high moral and intellectual integrity, one who is unwilling to compromise his medical opinion for any consideration other than the best health interest of the employee. An interest in health examinations and basic competence of the physician are factors which outweigh such considerations as how his services are obtained; i.e., whether company-employed, clinic staff member or independent practitioner.

III. THE MEDICAL HISTORY IN THE PERIODIC HEALTH EXAMINATION

The employee usually presents himself either with no complaints or with complaints of a minor nature at the periodic health examination. Confidence by the examinee in the interviewing physician is a prime requisite if a satisfactory inventory of body functions, past and present, is to be obtained. Unless the examinee knows that the interview is for his benefit there may be an understandable reluctance to disclose his complete medical history.

The interview should be conducted in complete privacy and the information obtained should be used only as in proper and long accepted physician-patient relationships. Importance is to be attached to the following: (a) family health history; (b) metabolic disorders; (c) infectious diseases; (d) allergies; (e) circulatory and respiratory function; (f) digestive disturbances; (g) living habits, both

at work and play; (h) pyschologic and behavior eccentricities; (i) self medication record; (j) previous notations on the individual health record; (k) occupational and other environmental influences.

IV. THE PHYSICAL EXAMINATION

A satisfactory examination requires alertness and adequate time from the examiner. Any tendency for the examiner to be hurried is to be deplored. The examining room needs to be well lighted, quiet and comfortable. The details of an adequate physical examination are well known to physicians from their medical school and hospital training, are described by standard textbooks on the subject, and need not be repeated here.

The frequency of periodic examinations varies with the age and sex of the industrial employee, the nature of occupation, the presence or absence of latent disease and individual health handicaps. There is a tendency for older workers and those in hazardous occupations to be examined at more frequent intervals. The interval between examinations most often reported for workers under medical supervision in non-hazardous occupations is one year. In so far as age affects the frequency of the examination, one proposed schedule is as follows: under 30 years of age, every 3 years; age 30-40 years, every 2 years; age 40-60 years, annually; age 60-65 years, semi-annually.

There can be, however, no ideal arbitrary examination interval for a group of people. Individualization is necessary. What is important is the establishment of confidence in the examiner and a willingness of the industrial worker to report any evidence of impairment of his well-being promptly so that whatever re-examination is necessary may be given without delay. The character and frequency of examinations is best determined for a group of employees after a study of the needs of the group by a physician experienced in industrial hygiene and the operation of industrial health programs. Such consultation and advice are available in the nation's various industrial areas.

Other than medical examinations before placement in industry and the periodic health inventory, the following special examinations have been found to be useful for industrial employees: (a) special examinations of workers in hazardous occupations; (b) examinations upon return to work after illness or injury; (c) job transfer examinations; (d) examinations of food handlers; (e) examinations by request of the employee.

It must be recognized by anyone using medical report forms, that no one form can be devised to fit, optimally, each examinee. Report forms are used widely in industry to serve three purposes: (a) to furnish a written record of an examination; (b) to furnish the examiner with a check list of basic essentials in the interview and examination; (c) to allow statistical compilation of facts gleaned by many different examiners through uniformity of reporting forms.

V. THE USE OF LABORATORY PROCEDURES

Two approaches to the selection of laboratory procedures for use with the periodic health examination are currently found in industry. Both have elements of usefulness to recommend their employment in suitable groups.

1) A battery of screening tests devised for speed and low cost application to large groups of people without selection by interview and physicial examination. Such tests are photofluorograms of the chest, blood serology, blood sugar estimations, urinalyses, etc.

2) Procedures selected by the physician after obtaining the history and physical examination of the man interviewed in a health check-up. This is the individual approach sanctioned by long experience of medical practice in dealing with the man with a complaint; i.e., the patient. In the ostensibly well person, the physician may not have the clue of a complaint or physical finding to guide him in selecting laboratory procedures.

Basically, a urinalysis and hemoglobin estimation or blood count are recommended. Until syphilis is brought under control blood serology should be had at intervals (depending upon community incidence) for case finding. Many industrial groups receive chest surveys at intervals of 18 to 24 months (or oftener in suspected minimal or known arrested pulmonary tuberculosis). An electrocardiogram, especially on men over forty years of age, has been helpful in revealing unsuspected evidence of vascular disease.

Additional laboratory or roentgenographic tests are dictated by the judgment of the physician in selected workers. In special examination programs for executives certain groups receive some blood chemistry (e. g., urea nitrogen and blood sugar), sigmoidoscopic and stool examinations, and gastro-intestinal X-ray studies, in addition to the above, as part of the routine.

VI. THE INTERVIEW AFTER THE EXAMINATION

Every lay person needs advice on health consonant with his ability to understand it. The examinee properly expects some comment from the physician as to the results of the examination. Whenever illness is discovered, the character of the advice is clearly indicated. Even in minor deviations from health, there is need for explanation of their significance by the physician. Early obesity, eating habits, use of laxatives, dental and gingival disease, skin disorders, smoking and drinking habits, emotional states and posture are excellent and frequently recurring starting points for health counselling.

The preventive potentiality of advice resulting from a health examination appeals to intelligent persons. It is the physician's responsibility to explain, lay proper emphasis and to assure himself that his advice is understood by its recipient. Routine written reports to the layman do not serve this purpose, are subject to misinterpretation, and are not recommended as a substitute for the personal interview. For the full fruition of this form of preventive medicine the man examined must act on the advice, his personal physician or consultant must know the pertinent findings which suggest further medical attention or treatment.

The examination cannot reliably forecast the future development of disease. Neither the physician nor the person receiving the health interview should disregard the inherent limitations of the examination. Negative findings may be replaced by positive findings the week after the examination. An effective periodic examination program requires that the persons concerned report signs or symptoms of illness immediately and without regard to the time of the last previous interview with the physician.

Labor statistics show that the average employee in the United States is absent from his job twelve days each year because of illness. An adequate industrial health program in many industries has reduced illness absences approximately fifty per cent. While adequate examinations cost money, the returns in dollars are quite apparent. Experience has shown that whenever industry has had an adequate medical program it is unlikely to discontinue what it has found to be a great asset to the health, happiness and efficiency of its personnel.

THE EVALUATION OF THE GALLIE FASCIA LATA REPAIR OF DIFFICULT HERNIAS

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The use of foreign material to aid in the repair of difficult hernias goes back as far as about 1900 when Wetzel and Goepel in Germany used silver wire filigree.

According to H. B. Sweetser[1], this was followed in this country by Willy Myer Wiener of New York and Perry of Massachusetts. In 1917 Sweetser reported two of his own cases with satisfactory results, and P. P. Cole[2], reported seven more in 1924. The use of artificial "prostheses" found little general favor, however, until Koontz in 1948[3], began using tantalum gauze mesh for recurrent ventral hernias with defective structures. In 1950[4] the same author reported 134 cases of ventral and inguinal hernias repaired with the aid of tantalum mesh with only one recurrence, some of the cases having been followed for four years or more.

Since his first report, various and sundry materials have been used—some with good and some with bad results. For example McNealy and Glassman[5], used vitallium plates; Jones[6], used stainless steel cloth; Bonnal, Corti and Bimar[7], tried nylon net while other materials such as flexible glass mesh, knitted wire mesh, preserved ox fascia and polythene (cellophane) have been tried.

Of all the foreign materials employed, it appears that stainless steel cloth (mesh) and tantalum gauze mesh have been found the most satisfactory and the reports in the liter-

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ature of the past two or three years have become too numerous to discuss at this time.

Having been in the habit of using the living fascia lata strips as advocated by Gallie and Le Mesurier in 1922[8], I noted with particular attention several cases in our hospitals in which the wire or tantalum mesh had been used with unhappy results, so that I eventually undertook to look up the results in the cases I could collect in which the Gallie repair had been employed.

The results were so good and the number of surgeons using this technique were so few that I decided to look up the reported results of both methods in the hope of stimulating a renewed interest in a tried and proven method of handling the difficult hernias in which the musculo-fascial structures were inadequate to expect success with the usual methods.

To my surprise I found that the end results with both techniques have been almost equally good and I would show preference for the Gallie-Le Mesurier operation only because it seems more physiological and causes less post-operative discomfort and complications. The only two drawbacks to the living fascia sutures seems to be their somewhat greater susceptibility to infection and the time consumed to perform the operation. The disability to the thigh from which the sutures are taken seldom, if ever, causes any patient enough discomfort to warrant its consideration in comparing these two techniques, and the time of operation can be cut down to only a little more than that required for an ordinary difficult repair if the use of two teams working simultaneously, as advocated by Coley and Burke[9], can be effected.

Personally, I arrange to have a second surgeon procure the fascial strips and fashion them into sutures in small Gallie-type needles while I am performing the ground-work of the hernial repair.

Gallie, Le Mesurier and Masson have emphasized that a hernial repair dependent on fibrous or scar tissue can be expected to fail because of the stretching tendencies of scar tissue as compared with fascial and tendinous structures. The excellent results obtained of late with the wire mesh, which, after the usual fragmentation of the filaments at the end of nine months, are essentially repairs with scar tissue, would tend to disprove the above tenets of Gallie et al, but I cannot help but believe that the long term follow-ups of the tantalum mesh repairs will show a greater tendency to recurrence than has been evinced in the literature to date. In any event, we are seeing an appreciably, though small, number of cases in this area in which the repairs have failed or the foreign material has had to be removed. Most of these unsatisfactory cases have been those with glass mesh prostheses.

As for infections with the Gallie technique, I have had only one and that was a delayed one of low virulence which did not affect a cure and which has been followed eleven years. In this case (see below), the patient's musculofascial structures of the abdominal wall could not even be approximated and the result was obtained by a woven latticework of fascia lata strips. Other authors have also had similar experiences in infected cases.

For the reader's benefit I will give some of the reported end results of the fascia lata and tantalum or stainless steel mesh techniques.

The following tables are not meant to be too accurate, in that details regarding the types of hernias and the average length of follow-up are not given. The longest period during which any individual patient in the series was followed is stated in the final column. On the whole, this presentation is as fair for one group as another, but it is evident that a tendency has existed to reserve the fascia lata repairs for the extreme and many-times recurrent cases as opposed employing them as a more routine procedure with all direct inguinal or ventral hernias. The latter has been favored by some authors reporting on the use of wire mesh.

The technique which I have employed is the typical Gallie-Le Mesurier type. Rather than fix the fascial strips with catgut, however, I have used silk exclusively. The sutures are locked by transfixing or knotting at frequent points to prevent motion or slipping, and the weaving extends widely from the approximated fascial margins so as to incorporate firm fascial structures or tissues on all sides.

The amount of fascia used should be plen-

Steel Mesh Repairs:

Author	Date	No. of Cases	Types of Hernia	Failures	Follow-up
Kootz[3]	1948	5	ventral	0	1½ yrs.
Koontz[4]	1950	134	ventral and inguinal	1	4
Koontz[10]	1951	77	inguinal	1	
Eginton[11]	1951	9	ventral	0	2
Flynn et al[12]	1951	45	ventral	1	4½
Guy et al[13]	1951	42	ventral, umbilical and inguinal	0	2
Lam[14]	1948	24	ventral	2	2
Dunlop[15]	1950	51	inguinal and incisional	2	2
Mufson[16]	1952	10	ventral and inguinal	3	

Fascia Lata Repairs:

Author	Date	No. of Cases	Types of Hernia	Failures	Follow-up
Gallie et al[8]	1922	50	recurrent ventral and inguinal	0	
Gallie et al[17]	1924	60	recurrent inguinal	0	4
Gallie et al[18]	1923	200	recurrent inguinal and ventral	6	2
Smith and Masson[19]	1940	85 (62 follow-ups)	incisional, epigastric and umbilical	5	5
McCloskey et al[20]	1940	82	inguinal	3	
Morse et al[21]	1943	11	ventral	0	1½
Iason[22]	1943	80	"large herniae"	4	
Austin et al[23]	1951	11	ventral and umbilical	0	
Laird	1952	12	ventral, lumbar and inguinal	0	11

tiful and any immediate post-operative fullness or thickness soon becomes inconspicuous, and the patient experiences no more post-operative discomfort than with any simple repair of commensurate size.

Infection has been no problem and the single instance encountered did not impair the result of one of my most difficult cases.

As opposed to the "work-hardening" and fragmentation seen when tantalum gauze is employed, the final repair is of unyielding fascial tissue rather than of scar or fibrous tissue, so that gradual stretching would not be expected.

The number of cases presented is small but the results would seem to warrant the employment of this technique in the more difficult cases where recurrence is to be expected.

Summary of Cases

An appraisal of the repair of difficult cases of epigastric, incisional, inguinal and lumbar hernias with Gallie living fascia sutures has been attempted. The end results have been compared with those reported with the use of wire mesh and other "prostheses." Twelve cases without a single recurrence are reported.

Case 1, Mrs. A. diS., 48 yrs. In 1924, the patient underwent a pelvic operation through a low mid-line incision. She developed an incisional hernia before leaving the hospital. Five years later, the hernia was repaired followed by a recurrence in three months. In 1932 she suffered a partial intestinal obstruction which was relieved without operation. On February 23, 1941 she again became partially obstructed.

Examination on March 6, 1941 showed an obese woman with a hernia below the umbilicus just to the right of the mid-line through which projected a large mass of intestines. The margins of the defect were widely separated and indistinct.

Operation (October 2, 1941): Patient had reduced forty pounds. There was a wide loss of the

fascia of the right rectus so that only the upper and lower margins could be approximated. Using strips of fascia from the thigh, the defect was closed by weaving with fascial sutures following the Gallie technique. The patient developed a post-operative pneumonia and a low-grade wound infection. A hemolytic Staphylococcus aureus and Streptococcus fecalis were obtained on culture. She was discharged on October 27, 1941 with a draining wound. On November 22, 1941 the wound was opened superficially and packed after removing a strip of necrotic fascia. Drainage persisted and on January 26, 1942 the wound was explored again. The fascia was intact and firm but a subcutaneous pocket was found to be lined with boggy, unhealthy granulation tissue. This was laid open and packed. Healing was slow but finally complete by June 6, 1942. The closure remained firm.

On July 13, 1950 the patient became obstructed following an acute attack of diarrhea while visiting in Mexico. She was flown home and the obstruction was relieved promptly by means of a Miller-Abbott tube.

On November 27, 1950, a check examination revealed a firm repair. The patient had been performing all her normal activities without the aid of any binder, corset or external support, and is personally known to have remained well up to the present time, a period of ten years and four months.

Case 2. Mr. K. DeR., 38 yrs. His past health had been good except for recurrent diverticulitis of the colon and paralytic poliomyelitis resulting in paralysis and shortening of the left leg.

In 1937 a right inguinal hernia was discovered and repaired in Buffalo, N. Y. The hernia recurred and in 1939 another surgeon repaired the hernia, supposedly with living fascial strips from the thigh. Shortly thereafter he lifted his wife into a car and developed an acute recurrence with sudden pain and protrusion in the inguinal region.

Examination on December 8, 1949, revealed a definite herniation with a protrusion extending into the upper part of the scrotum. The defect readily admitted a man's thumb.

Operation (January 27, 1950): The hernia was repaired for the third time. Strips of fascia lata were used according to the Gallie technique to reinforce by weaving the attenuated conjoint tendon and rectus fascia to Poupart's ligament and also the attentuated fascia of the external oblique to Poupart's ligament.

The post-operative course was uneventful and the patient was discharged on the fifteenth post-operative day.

A follow-up examination on October 16, 1952, showed a firm repair. The patient was performing all his normal activities without limitations, and was eminently pleased.

Case 3. Mr. E. G., 45 yrs. This patient had a right inguinal hernia which had been repaired on two occasions, March 19, 1952 and February 16, 1944, with prompt recurrences. Otherwise, his past health had been good. Twenty-four hours before being seen he became completely obstructed by strangulation of the hernia.

Examination on May 12, 1951, showed a large scrotal hernia on the right with a definite strangulation of the contents of the sac, with vomiting, prostration and cramp; abdominal pains.

Operation (May 12, 1951): Undertaken as an emergency procedure, the operation revealed that the tremendous hernial sac contained the cecum and a portion of the terminal ileum. These were discolored and bordering on gangrene. The circulation returned after releasing the constriction and the hernia was repaired according to the Gallie technique, weaving the conjoint tendon and margin of the rectus sheath to Poupart's ligament with living fascial strips from the thigh. The medial margin of the fascia of the external oblique was likewise attached to the inguinal ligament wtih fascial strips. The cord was transplanted according to the Halsted procedure for direct herniae.

The patient was discharged on May 27, 1951 without further complications but it was found that the patient had an indirect hernia and a spermatocele on the **left** side. This was subsequently repaired by the Halsted method without fascial strips on August 4, 1951 following a partial strangulation which could be reduced prior to operation.

Follow-up examination on October 30, 1952 revealed a firm repair on both sides and the patient was able to perform hard manual labor without artificial support or disability.

Case 4. Mrs. E. S., 46 yrs. This patient was an obese woman who had had a total hysterectomy performed through a low mid-line incision on March 7, 1951. Immediately after her return home she noticed a swelling of her wound which gradually increased in size until it approached the size of a honey-dew melon.

Examination on September 10, 1951 showed a very obese woman with an incisional hernia of tremendous proportions as described above. The margins of the defect were well outlined but markedly separated.

Operation (September 17, 1951): The hernia was repaired in the usual manner approximating the fascial edges with interrupted black silk sutures under considerable tension. The suture line was reinforced by weaving fascial strips from the thigh over the line of suture, the strips being attached on either side in good firm fascia of the rectus sheath.

She made an uneventful recovery and a follow-up examination on October 16, 1952 showed a solid repair, permitting her to resume any desired occupation without external support. A tiny (1 cm.) umbilical protrusion was found of which she was unaware. I doubt that this had any connection with the repair and I consider this probably to be an "incidental finding." Anyhow, no further surgery was indicated.

Case 5. Mrs. M. J., 55 yrs. This patient gave a history of an appendectomy in 1938 (right rectus incision); a supravaginal hysterectomy for uterine fibroids in 1942; and a left nephrotomy for renal stones in 1947. One year after her kidney operation, she noticed a painful bulge in the incision in the left lumbar region which gradually increased in size and in the degree of discomfort.

Examination on May 13, 1950 showed an obese woman with a large protuberant abdomen. A low right paramedian and a low mid-line incision showed firm healing, but there was a poorly delineated bulge or weakness along the line of the left lumbar incision. There was a definite herniation at the lower portion of the lumbar triangle which was tender to palpation. This evinced an impulse on coughing. The patient's threshold for pain was quite reduced.

Operation (May 22, 1950): The obvious defect was found to be at the lowermost portion of the lumbar triangle, resulting from a separation of the external oblique muscle fibres and the lumbodorsal fascia near the origin of the muscle from the fascia. The superior lumbar triangle appeared reasonably firm. The margins of the herniation were very indstinct and the muscles them-

selves (external and internal oblique) seemed flaccid and attenuated. No true sac from the peritoneum was found, although the latter was opened. The fascial and muscular defects were closed with silk sutures as firmly as possible, following which fascial strips from the thigh were woven over a broad area in the region of the former protrusion, being attached in firm structures remote from the underlying line of sutures. The superior lumber triangle was also reinforced with fascia sutures.

The patient was discharged on the fourteenth post-operative day without complications.

Follow-up examination on August 25, 1950, showed a very satisfactory result and a complete relief of pain although there was a diffuse fullness of the whole left flank anteriorly as compared with the right side. This had been present before operation and suggested injury to the 12th intercostal nerve. Diminished cutaneous sensation over the distribution of T-12 also suggested this and the patient stated that this had been present following the original operation.

A check on October 17, 1952, showed the condition unchanged and the patient able to perform all duties without discomfort. The diffuse bulge persisted due to the obvious damage to the anterior branch of the 12th intercostal nerve.

Case 6. Mrs. C. D., 45 yrs. This patient was admitted in January 1952 with symptoms of intestinal obstruction of several days' duration. Twelve years previously she had had a Caesarian section and an appendectomy. Shortly afterwards she developed an incisional hernia and pains simulating gall-bladder disease. In December 1951, a cholecystogram was normal.

Examination revealed a hernia through a right rectus incision with a large protrusion of intestine.

Operation (February 5, 1952): A loculated hernial sac was found containing many loops of intestine. There were numerous fascial defects and strong, reliable fascia was encountered 15 cm. from the mid-line. The attenuated fascia was removed and a two-layer closure accomplished with silk sutures. This was reinforced with about ten strips of woven fascia lata.

The post-operative course was uneventful and she was discharged on February 17, 1952, showing a sound repair. The patient has failed to respond to any correspondence since that date.

Case 7. Mr. A. H., 59 yrs. The patient had had some form of repair of an inguinal hernia, right, seven years previously, at which time fascia had been taken from the thigh to aid in the repair. Two years later a recurrence was noted and he wore a sacro-iliac belt when he worked, to relieve a "feeling of weakness" in the inguinal region.

Among other complaints were varicose veins and a chronic prepatella bursitis.

Examination on February 14, 1952, revealed a large, recurrent, indrect inguinal hernia on the right side with an equally large, indirect inguinal hernia on the left side. The fascial structures on both sides were relaxed and bulging, indicating poor quality of the external and internal oblique muscles and fascia. There was also a marked dilatation of the greater saphenous veins of the right leg with edema of the right leg, and a chronic prepatella bursitis, left.

Operation (March 14, 1952): Both herniae were repaired in one stage according to the Gallie technique, reinforcing the attachment of the conjoint tendon and the inguinal ligament with woven fascial strips, and subsequently reinforcing the fascial repair with the same material.

The post-operative course was unremarkable and in six weeks the patient resumed his occupation as a gardener without local support.

Follow-up on October 21, 1952, showed firm healing of both herniae and the patient able to do any kind of work. He had developed symptoms of a herniated intervertebral disk, however, and was referred to an neurosurgeon.

Case 8. Mr. E. R., 55 yrs. This laborer on the state roads was first seen on May 18, 1946, complaining of pain in a large, right-sided, scrotal hernia. He had had an appendectomy twenty years previously and there was an incisional scar just above the protrusion. He had become very obese and at first it was hard to determine whether the herniation came from the previous incision as well as from the inguinal ring or not. Reduction could be maintained with great difficulty. He also had a severe post-phlebitic ulcer on the left leg, for which he wore a laced harness extending from the ankle to the left groin.

After having reduced twenty-five pounds, on June 4, 1946, a Halsted type repair of the huge indirect inguinal hernia was performed and the patient returned to strenuous labor on the roads. Three years later he returned with a small, painful recurrence and a marked increase in weight (21½ lbs.).

Operation (September 18, 1951): The hernia was again repaired as before, except that the repair was reinforced with fascial strips according to the Gallie technique.

The post-operative course was uneventful and the patient resumed his occupation in eight weeks. On October 30, 1951, the left greater and lesser saphenous veins were ligated with great benefit.

Follow-up on April 8, 1952, showed a firm repair, the patient having continued in his former occupation.

Case 9. Mrs. E. A., 68 yrs. This obese woman had had an umbilical hernia repaired with a prompt recurrence. A second repair was performed by the same surgeon approximately three years later at which time some incarcerated bowel was penetrated and the repair broke down before the patient left the hospital, presumably because of infection. Since that time she had worn a belt with reasonable comfort.

Two days before admission on June 17, 1952, she developed symptoms of intestinal obstruction and was brought to the hospital in a state of shock. She recovered on conservative treatment.

Examination revealed a large, loculated, irreducible hernia just above the umbilicus with a narrow neck measuring one and one-half inches in diameter. Several loops of intestine could be seen and felt in the sac.

Operation (June 20, 1952): Two large loops of ileum were found entangled in a multi-loculated sac and firmly adherent to the same with fibrous adhesions. These were freed up and the sac and attenuated fascia were excised. Healthy fascia was then united in a three-layer closure with black silk. The whole suture line was then woven with strips of living fascia taken from the left thigh.

Immediately following operation the patient again went into a nearly fatal shock which was treated by blood transfusions and Cortisone. It was recognized then that she probably had adrenal insufficiency which had caused the initial shock, which had been out of proportion to the degree of intestinal obstruction present on admission.

Her subsequent recovery was unremarkable except for an accumulation of sterile sero-sangren-

ous fluid in the wound, which was removed by aspiration.

She was last seen on August 26, 1952, with a firmly healed wound, performing all her duties without the aid of any form of external support. The patient was uncooperative and further follow-up was abandoned but information received in October 1952 disclosed that no recurrence had occurred, and that the patient was very well.

Case 10. Mr. L. U., 45 yrs. This patient was a husky male who had been treated for peptic ulcer for three years without relief of epigastric distress and without visualization of the ulcer roentgenologically.

When first seen on June 23, 1952, the patient was critically ill with a completely rigid, board-like abdomen, having been suddenly stricken with acute upper abdominal pain eleven hours previously. The pains had rapidly spread over the entire abdomen.

A diagnosis of ruptured peptic ulcer was made and an immediate mid-line epigastric incision was made. The stomach and duodenum were normal but a ruptured, gangrenous appendix was removed.

A partial wound dehiscence occurred on the eighth post-operative day and when seen on September 15, 1952, a poorly defined, but large incisional hernia was present.

Operation (September 30, 1952): The redundant paritoneal protrusion was excised and a three-layer closure under extreme tension was performed with black silk sutures. The whole length of the repair was then woven with strips of living fascia from the thigh. In spite of the brief length of time between operations, the wound healed without infection.

Follow-up examination on November 7, 1952, revealed an excellent, firm repair and the patient had returned to full activity. A complete cure is expected at the time of writing this report, although too little time has elapsed to make any too positive statement.

Case 11. Mr. W. S., 42 yrs. This patient worked for an Express Company, carrying packages of every description. Ten years previously he had a right, indirect, inguinal hernia which was operated upon with prompt recurrence. He procured a truss which he wore until December 26, 1950, when he was first examined.

Several days before this date, while sitting at home, he developed sudden epigastric pain and noticed a small knot in the epigastrium which became increasingly tender.

Examination on December 26, 1950, disclosed a tender protrusion in the mid-line above the umbilicus, a large, right-sided, direct inguinal hernia and a smaller, direct, inguinal hernia, on the left.

Operation (January 4, 1951): The epigastric and the left, direct, inguinal hernias were repaired with black silk sutures. On January 12, 1952, the right, recurrent, inguinal hernia was repaired and was found to be indirect instead of direct as had been believed prior to operation. Gallie living fascia sutures were used in the usual manner to effect a Halsted-type repair.

Follow-up on November 8, 1952, revealed a completely satisfactory result in all three locations. The patient had resumed his occupation with the Express Company.

Case 12. Mr. L. N., 58 yrs. This car repairman had had a bilateral inguinal hernia. Some years previously the right side was repaired with a small recurrence. Three years ago the left side was repaired by another surgeon with satisfactory results. Two days before examination the patient underwent a transurethral resection for prostatic hypertrophy.

Examination on October 16, 1952, revealed a small, direct, recurrent, inguinal hernia on the right and a firm repair on the left side.

Operation (October 28, 1952): The fascial structures were so attenuated and shredded that no relaxing incisions of the anterior rectus sheath were deemed advisable. A Halsted-type repair of a direct hernia was performed, weaving the area between the rectus sheath and the inguinal ligament with numerous fascial sutures from the thigh.

When last seen on December 1, 1952, a good, firm repair was noted. The patient was to return to work in two weeks.

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PROBABLE LEUKEMOID REACTION ASSOCIATED WITH GASTRIC NEOPLASM

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Leukemoid reactions, although uncommon, may occur in a variety of diseases such as various acute and chronic infections, severe hemorrhage, hemolytic anemias, poisonings, Hodgkin's granuloma, and tumors.[1] Since the blood and bone marrow pictures may be indistinguishable from leukemia, the differential diagnosis may be extremely perplexing.

The following case illustrating this differential diagnostic difficulty is submitted herewith to add to the few reported cases of leukemoid reactions associated with neoplasm.[2, 3, 4, 5, 9, 11]

CASE REPORT

J. B., a 64 yr. old colored male was first seen in the Medical Clinic of the Delaware Hospital, Case No. 194334, in July, 1952, for puffiness of his legs, vomiting, and vague abdominal pains of about one month's duration. The patient stated he could not eat or drink moderate quantities of food at one sitting since this produces vomiting.

The principle finding on physical examination was a firm, left upper quadrant mass extending four fingers below the left costal cage, and which was thought by the examiner to be spleen. A firm, smooth liver edge was also palpable about one finger breadth below the right costal margin.

A blood count revealed a slightly hypochromic anemia with 3,200,000 erythrocytes per cu. mm. and a hemoglobin of 8.1 gm. (52%). The leukocyte count was 30,600 with polys seg. 63%; poly non seg 16%; lmphocytes 17; monocytes 2; eosinophiles 1; and basophiles 1. The total serum protein was 6.48 gm./100 cc. The blood Mazzini was negative, and a urinalysis was negative except for plus one albumin.

A sternal bone marrow aspiration revealed a marked increase in the metamyelocytes and band forms. Erythopoiesis was present but proportionately decreased, with a erythroid-myeloid ratio of 1 to 4. Megakaryocytes were seen in apparently normal proportion and appearance. Conclusion: "Bone marrow findings equally consistent with leukemoid reaction or chromic granulocytic leukemia."

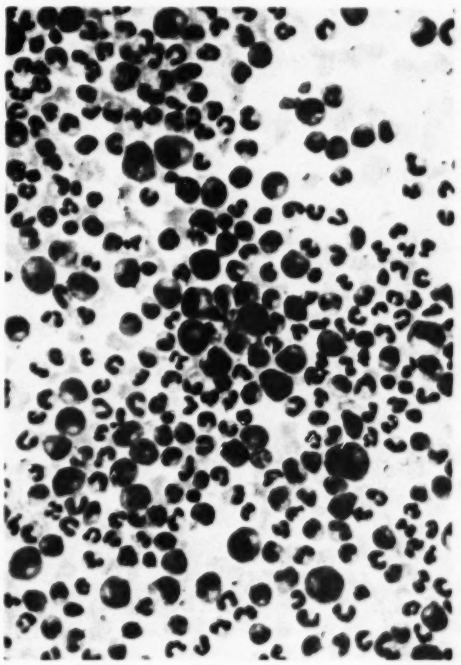

FIG. 1
Bone marrow, showing myeloid hyperplasia.

In the meanwhile, a gastrointestinal series was done, revealing involvement of almost the entire stomach by an infiltrating lesion producing numerous irregular filling defects in the cardia, both curvatures and the prepyloric region. The impression was that of neoplasm of the stomach.

A few days later the patient was admitted to the Delaware Hospital because of coffee-ground emesis.

Physical examination revealed a thin, chronically ill Negro male with the same physical findings as before. After admission he continued to vomit coffee-ground fluid with some bright red blood. Also, he had numerous grossly bloody stools. Blood pressure was maintained by transfusions of whole blood. The gastrointestinal bleeding subsided in 48 to 72 hours.

Admission Laboratory Studies: Hemogram: RBC, 1,900,000; Hb., 6.4 gm (41%); WBC,

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54,200; Polys Seg., 48; Polys Non-seg., 44; Lymphs, 6; Monos, 2; Venous platelet count, 148,000.

FIG. 2

GI series, showing filling defect of stomach.

BUN, 10 mg/100cc; Serum uric acid, 6.7 mg/100 cc; Serum phosphorus, 5.6 mgm-/100cc; Prothrombin time, 95%; Bleeding time, 1 min. 20 sec.; Coagulation time, 3 minutes.

During the subsequent month of hospitalization the RBC and Hemoglobin were maintained at normal or near normal levels by transfusions of whole blood, and the leukocyte count ranged between 49,600 and 78,000. (Table I)

Because of the x-ray evidence of an intrinsic lesion of the stomach, it was decided that exploratory laparotomy would be performed in order to obtain a biopsy and to ascertain whether the stomach was involved with carcinomatous or lymphomatous infiltration.

At surgery the liver and spleen were found to be grossly normal. The stomach was bound to the interior surface of the left lobe of the liver, and contained a large tumor, approximately ten centimeters in diameter, which was quite firm and was felt to be carcinoma of the stomach. There were numerous apparently metastatic nodules in the omentum. Two of these were removed and the abdomen was closed. No biopsy of the primary mass was taken. Microscopic examination of the nodules revealed them to be lymph nodes showing reactive hyperplasia. (S52-25931)

TABLE 1

BLOOD COUNTS

	RBC (mill /cu.mm)	Hgb. (Gm.)	WBC (per. cu. /mm.)	Polys. Seg. (%)	Polys. Non-Seg. (%)
7/10/52	3.2	8.1	30,600	63	16
7/17/52	2.6	7.2	45,600	69	21
7/30/52	1.9	6.4	54,200	48	44
8/ 1/52	3.0	10.1	78,000	61	36
8/11/52	3.4	12.9	49,600	76	20
8/18/52	4.0	12.4	59,500	79	17
8/25/52	3.6	11.9	67,400	28	70
9/ 4/52	4.2	14.0	35,100	45	50
9/18/52	4.3	14.7	42,600	43	50
9/30/52		8.1			
10/ 2/52		7.5			
11/ 2/52	3.7	11.7	72,000	71	18

With the possibility in mind that this gastric lesion might be a lymphoma, sarcoma, or leukemic infiltration, a trial course of x-ray to the gastric region was given (tumor dose of 1000 roentgens over fourteen days). There was no symptomatic improvement and a repeat gastrointestinal series showed no regression of the gastric lesion. Therefore, it was concluded that the patient probably had advanced carcinoma of the stomach with a leukemoid reaction, and was discharged from the hospital in August, 1952 to spend the remaining days of his life with his family, and to return as an outpatient at intervals for blood transfusions.

He was brought back in November, 1952 unconscious, pulseless and with Cheyne-Stokes respirations. He was given blood, oxygen and stimulants, but expired 12 hours later. Autopsy permission was not obtained. A blood count just prior to death showed 72,000 white blood cells per cu. mm.

DISCUSSION

From the blood and bone marrow findings the diagnostic possibilities were considered to be as follows:

(1) Chronic granulocytic leukemia

(2) Gastric carcinoma with leukemoid reaction

(3) Chronic granulocytic leukemia coincident with gastric carcinoma

(4) Leukemic infiltration of the stomach

In favor of (1) were the increasing leukocytosis and the rise in per cent of immature forms. It was difficult to reconcile the lack of blast forms although in this regard Custer[1] said, "Granulocytic leukemia is the notorious faker of the group, frequently existing in its chronic form with a hyperleukocytosis and slight immaturity of granulocytes as the only evidence."

The persistence of platelets as well as the slight increase in blood phosphorus and uric acid were of equivocal value. The platelets often persist and may even increase until the terminal stages of a chronic granulocytic leukemia. The slightly high uric acid and blood phosphorus were interpreted as a manifestation of cellular hyperplasia and consistent with all four possibilities.

Possibilities (3) and (4) are considered highly improbable. Possibility (3); coexistence of a gastric neoplasm and leukemia, gains only slight support from Moore[6] who states that a person with one cancer is six times more apt to develop a second cancer than would be expected by chance alone.

Possibility (4) of leukemic infiltration of the stomach would be rare and even more unlikely in the absence of significant splenic, hepatic or lymph node enlargement. Although several such cases have been reported with lymphatic leukemia[7] it is unlikely as a manifestation of myeloid leukemia.

The second possibility of gastric carcinoma with leukemoid reaction was advanced by gastric bleeding, next by x-ray evidence and lastly laparotomy and gross interpretation of a gastric neoplasm.

Most writers on this subject postulate hemorrhage from the neoplasm or bone marrow metastasis as a stimulant for the leukocytosis. In this connection Wintrobe[8] states, "Severe hemorrhage may be followed by marked leukocytosis of the myeloid type." Custer[1] agrees with the following statement, "Severe hemorrhage is sometimes followed by neutrophilia, leukocytosis attaining heights of 50,000-75,000 per cu. mm. as a result of diffuse and rapid bone marrow hyperplasia.

A few cases of malignancy have been reported in which a leukemoid reaction was manifested without evidence of severe bleeding or bone marrow metastasis.

Morrison[9] says that a leukocytosis occurs in about 2/3 of patients with cancer. Sturgis[10] is in agreement with the above and adds that the leukocytosis is associated with an increase in band forms in 85%

Meyer & Rotter[11] report two cases of adenocarcinoma of the stomach, unassociated with bone metastases, and each showing a leukemoid picture, myeloid in type.

The case here presented was considered similar to the last two above and like them displayed no apparent bone metastases. The leukocytosis may have been a result of hemorrhage or of the gastric neoplasm.

SUMMARY

A case of marked leukocytosis associated with a gastric tumor is herein reported for discussion of the differential diagnosis, which appears to lie between (1) chronic granulocytic leukemia and (2) carcinoma of the stomach with leukemoid reaction. The evidence accumulated in this case favors the latter possibility.

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CARCINOMA OF THE ESOPHAGUS

A Case of Double Primary Carcinoma of the Gastro-intestinal Tract

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Carcinoma of the esophagus is a relatively rare disease but not uncommon. Its treatment

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has changed radically in the past ten years and hopes are high that the cure rate will continue to increase although some factors still need further extension and exploitation.

From January, 1946 to September, 1952 at the Delaware Hospital, where 59,495 adult patients had been admitted, the diagnosis of carcinoma of the esophagus had been made fifteen times. In this group are included only cases of epidermoid carcinoma arising in the esophagus, excluding cases of cardia of the stomach with extension into the esophagus and extrinsic carcinoma of the lung extending into it. No case of carcinoma of the esophagus was found in children; thus, they were excluded from this study. Consequently, a percentage of 0.025% of the admissions had a carcinoma of the esophagus. In contrast, during this same period 94 cases of carcinoma of the stomach and 110 cases of carcinoma of the rectum were diagnosed, a percentage of 0.16% and 0.18% respectively. Table I shows the incidence per year of these three forementioned carcinomas.

TABLE 1

Year	Adult Admissions	Cases of Ca of Esophagus	Cases of Ca of Stomach	Cases of Ca of Rectum
1946	7,543	0	18	10
1947	7,873	1	15	12
1948	8,310	3	11	10
1949	8,716	3	16	23
1950	9,241	3	3	30
1951	9,989	1	8	9
1952	7,723	4	23	16

In this series of 15 cases all were male and their age varied from the youngest of 52 to the oldest of 86 years, an average of 64.4 years. The patients were predominently in their sixth and seventh decades. Merendino and Mark[1] found carcinoma of the esophagus in the ratio of 11.5 males to 1 female. Wu and Loucks[2] presented a ratio of 13 to 1 but their series also included cardia of the stomach carcinoma. The American Cancer Society in their *Statistics on Cancer*[3] for the United States in the year 1946 had a total number of carcinoma deaths to be 182,005. 3,307 of these deaths were due to carcinoma of the esophagus, a percentage of 1.8%. Of these, 2,629 were male and 678 were female, a ratio of 3.87 to 1.

The predominant complaint that urges the patient to consult his physician is dysphagia. This can range from difficulty in swallowing solid food to inability to drink liquids. Dysphagia was evident in 12 of the 15 patients, a 80% find. In the Merendino and Mark[1] series, dysphagia was present in 91.8% of the cases. Other significant symptoms which the 15 patients presented were as follows: 6 experienced substernal and back pain, 2 complained of fatigue, 6 had lost weight, 1 felt vague abdominal distress, 1 had melena, and 2 had hemoptysis. Most of the patients presented more than one of these symptoms.

The duration of the above mentioned symptoms ranged from 4 weeks to 1 year, an average of 17.2 weeks. The longer the duration the poorer is the prognosis. This is well illustrated in this series of 15 patients where the only case to be free of distant disease at the time of resection is the case to be presented in which the length of symptoms was the shortest—4 weeks.

The diagnosis was established in 9 cases by barium swallow and confirmed in 9 cases by biopsy through esophagoscopy. In the remaining cases, the diagnosis was made at autopsy or at exploration. The anatomical location of the lesion was in the upper third of the esophagus in 4 instances, in the mid-esophagus in 9 cases, and in the lower third of the esophagus in 2 cases. These figures coincide well with Merendino and Mark[1] series where in 99 cases the upper esophagus was involved 22 times, the middle esophagus 51 times, and the lower third of the esophagus 27 times. Of these 15 cases, 6 were deemed inoperable; 9 cases were explored; and of these, 3 cases were resected. Two of these resected cases died postoperatively within five days and the third was discharged well. Thus, we see an operatability rate of 60%, a resectability rate of 33-1/3% and a mortality rate of 66-2/3%. (See Table 2.) The two

TABLE II

Location of Ca of Esoph.	No. of Cases	Not Explored	Explored Only	Resected
Upper One Third	4	2	1	1
Middle One Third	9	3	4	2
Lower One Third	2	1	1	0

patients that were resected and died postoperatively were only palliative attempts since both showed evidence of extension of their disease at the time of operation. The third case was without widespread disease and

this correlated well with the short duration of the symptoms and operative findings. This case is to be presented later in the paper in more detail. Wu and Loucks[2] presented 132 cases of carcinoma of the esophagus in which 90 cases were explored—an operatability rate of 68%; and of these, 57 cases were resected—a resectability rate of 63.3% in which 11 cases died postoperatively, a postoperative death rate of 19.2%. The follow up period has been too short to determine the salvage rate in 3 to 5 years. Sweet[4] mentioned in his series that during the past 12 years of all cases seen, 85% were explored and 65% had a resection performed. Of those explored 76% were operated upon successfully. Of the patients treated by resection and anastomosis, the operative mortality among those whose growth was in the lower esophagus or at the cardia was 11.6%. Among those whose tumor was in the mid-thoracic segment, the mortality was 24.3%.

In a theoretical sense Merendino and Mark[5] showed that the theoretical curability of squamous cell carcinoma is about 34%, but when all factors are considered the potential 5 year cure rate is about 20.4%. Thus far these figures cannot be approached. Sweet[4] showed a rate of 17.5% in his five year cures of carcinoma of the esophagus in the lower third and cardia. In mid-thoracic lesions the survival rate dropped to only 4% in five years. Thus much will have to be done to reach the potential rate of Merendino and Mark[1].

What are some of the factors that we as physicians can consider and utilize to bring up this cure rate?

1. Early awareness of obscure symptoms to prevent hopelessness later.

2. More frequent use of barium swallow for patients complaining of dysphagia.

3. Use of the esophoscope to confirm evidence found on barium swallow or for obscure symptoms of dysphagia not elucidated by barium swallow.

What factors does this type of tumor in itself possess that renders it difficult to remove?

1. The esophageal wall is perforated by the carcinoma not infrequently at an early stage in its development, although suppurative mediastinitis and fistulous communications with other viscera may not occur until later. The esophagus does not have the serosal coat which serves as an efficient barrier to perforations as in other organs of the lower gastro-intestinal system.

2. Esophageal carcinoma is usually highly malignant and extends intramurally up and down the esophagus for surprising lengths, sometimes far beyond the palpable margins of the tumor and at times beyond the point of transection. Contiguous organs within the chest or abdomen may be implicated at the time of operation and one may find the stomach, liver, justacardiac nodes to be involved.

3. The tumor is often inoperable at the time of diagnosis because of the degree of local invasion in the area of the tumor which occurs early.

4. The patient is not always a fit candidate for surgery or radical therapy because of the concomitant aging chances. The age group is usually in the sixth and seventh decades and in this group cardia-vascular disease is rather prevalent. This is well shown by Sweet's review[4].

5. Malnutrition may be far advanced not because of the carcinoma itself but because of the patient's inability to swallow food over long periods of time. See the statements of Merendino and Mark[1].

6. The technique of transthoracic esophagectomy and primary anastomosis involves grave physiological and anatomical problems which require skill, judgment and resourcefulness.

7. Radiation therapy is of small consequential value and this therapeutic tool cannot be used with much success.

All these factors, however, can be minimized if the diagnosis is made early when the patient presents himself for examination. A widespread educational program for the unsuspecting candidate to seek aid early for any signs of dysphagia will also assist in the fight against this carcinoma.

The treatment of carcinoma of the esophagus, since the first successful resection and esophagogastric anastomosis in this country by Adams and Phemister[6] in 1938, has made rapid strides. Torek's[7] procedure which had

been used was most unsatisfactory leaving an esophageal fistula in the neck and requiring a long plastic procedure to unite this fistula to the stomach. With the use of a primary anastomosis within the chest of a thoracic stomach the outlook has improved. Garlock and Sweet[8-16] deserve most of the credit in establishing this approach in the treatment of carcinoma of the esophagus. Sweet's[4] latest analysis of 254 cases which had been so treated in the past 12 years certainly shows what can be done for this problem and opens the future for further advancement.

CASE REPORT

W. T., Del. Hosp., No. 191397, white male, age 70 years, entered the Delaware Hospital on April 26, 1952 complaining of difficulty in swallowing solid food for the past three weeks. He had been seen the week before in the Gastrointestinal Clinic where on physical examination a mass in the right lower quadrant and a weight loss of 30 pounds was revealed. He stated that he was only able to take semi-solid food and liquid foods but because of the occasional substernal pain, he had voluntarily restricted his diet. There were no chest or cardiovascular difficulties. X-ray studies by barium swallow revealed a constricting lesion of the mid-esophagus and

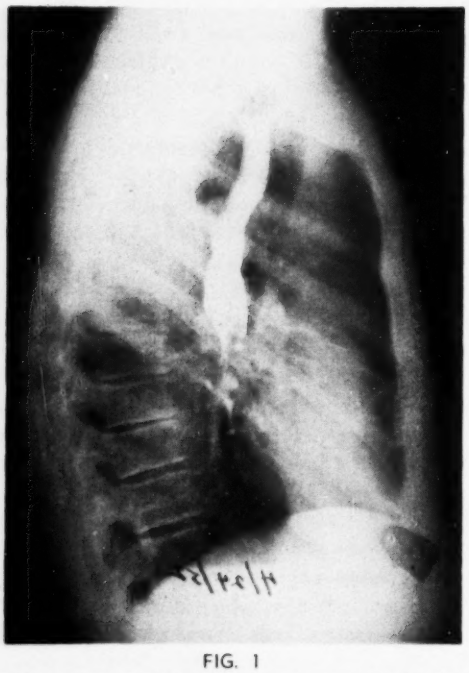

FIG. 1
Pre-operative barium swallow, showing constricting lesion of mid-esophagus.

FIG. 2
Pre-operative barium enema, showing constricting lesion of sigmoid colon.

by barium enema a defect in the sigmoid colon. Both lesions were interpreted as showing evidence of carcinoma. On admission, the above findings were confirmed and his weight was 115 pounds. Laboratory studies revealed hemoglobin of 78% or 12.2 gms., white blood cells—6,100 with no shift, blood sugar of 85 mg.%, blood urea nitrogen of 9 mg.%, plasma chloride of 640 mg.%, plasma CO^2 of 50 vol. %, total serum protein of 5.81 gm. %, serum albumin of 2.93 gm. %, serum globulin of 2.88 gm. %, prothrombin time 100%, negative urine, evidence of occult blood in stools by both the benzidine and guaiac tests, no free hydrocloric acid before or after histamine injection at gastric analysis with a total hydrocloric acid of 3-8 units.

The patient was prepared for operation by having all loose teeth extracted and frequent mouth care given. For four days he received 250 cc of whole blood daily and was placed on a high protein, carbohydrate, vitamin liquid diet. On May 5, 1952 an esopha-

goscopy was performed and a biopsy taken 34 cm. down from the upper alveolar ridge which proved to be epidermoid carcinoma. On this day his laboratory count showed 4.3 million red blood cells, 14.4 gms. or 92% hemoglobin, and a hematocrit of 44.5 mm. packed cells.

Operation

On May 6, 1952 an exploratory thoracotomy was performed entering the left chest through the bed of the 7th rib using the postero-lateral approach. The posterior mediastinum was dissected and revealed the carcinoma of the esophagus which was situated below and behind the arch of the aorta measuring about 8x5 cm. in size. There was no evidence of local or distant invasion and the hilar nodes were free of disease. The dissection proceeded and the esophagus was mobilized from the arch of the aorta to the diaphragm. The diaphragm was opened by a radial incision extending from the esophageal hiatus out to the rib margin anteriorly. Exploration of the abdominal cavity revealed no evidence of disease either in the liver or about the cardiac end of the stomach. Palpation of the sigmoid colon showed the mass as seen by x-ray study. The stomach was mobilized from the liver, spleen and pancreas by ligating the short gastric arteries, left gastric artery at the coaliac axis and the left gatsro-epiploic artery; thus removing enbloc all structures in the region of the cardia. The lesser omentum was freed from the liver and the stomach mobilized distally to the duodenum on both the lesser and greater curvature preserving the blood supply at the right gastric and right gastro-epiploic arteries. This allowed the stomach to be delivered into the chest through the diaphragm. The stomach was then transected through the fundus removing the cardia and all node bearing area with the specimen. The wall of the stomach was closed using an inverting stitch of 00 chromic catgut and 4-0 black silk. The dissection was then completed from above and below the arch of the aorta freeing the tumor, and in the process the second and third intercostal arteries were ligated. This allowed the dissection to proceed proximally for a distance of 6 cm. above any palpable tumor in the esophagus. The esophagus was here transected, and the specimen removed. An eliptical incision was then made on the anterior surface of the fundus of the stomach to approximate the size of the esophagus and this portion of the stomach was removed. The anastomosis was then proceeded with using the three layer suture technic of Sweet utilizing 4-0 black silk. The anastomosis was done anterior to the arch of the aorta and above it. The Levine tube, previously passed, was inserted past the anastomosis into the stomach and the stomach was anchored to the postero-lateral surface of the chest using 4-0 black silk. The diaphragm was closed using 2-0 black silk interruptedly and a new esophageal hiatus was formed about the pylorus of the stomach. The chest was drained using a counter incision for the rubber tube in the dependent portion of the chest, 400,000 units of aqueous penicillin was instilled into the chest cavity, and the chest closed in layers using 2-0 and 4-0 black silk. The drain was placed in under water drainage with 12 cm. of suction.

The post-operative course was uneventful. He was placed in an oxygen tent for 24 hours, and had frequent endotracheal aspirations to minimize accumulations of secretions which the patient had difficulty in expectorating. The second post-operative day he was out of bed, and tube feedings were begun. On the third day the under-water chest drainage was removed, on the fourth day a liquid diet was begun, and on the fifth day the Levine tube was removed. A pleural effusion developed which was controlled by a thoracentesis on the sixth day, thereafter his course continued satisfactorily.

The pathological specimen, (S52-24893), removed at operation was sectioned revealing squamous cell carcinoma of the esophagus with invasion into the muscular wall. Examination of the distal end found 10 lymph nodes about the resected cardia of the stomach that were free of metastatic disease.

On June 4, 1952 a swallowing function test was performed and it demonstrated a well

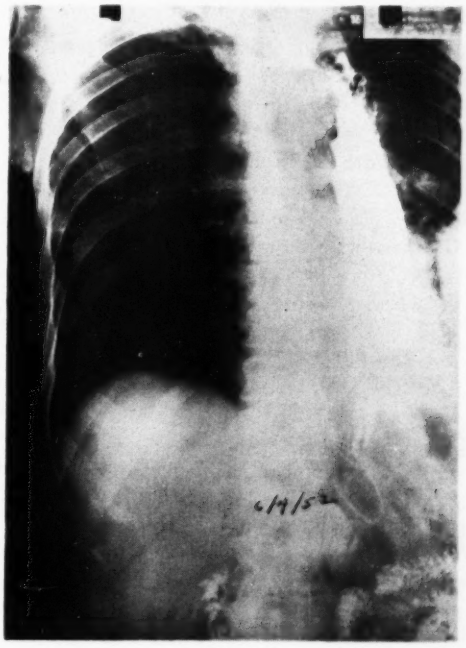

FIG. 3
Post-operative barium swallow. Normal functioning esophagogastrostomy above arch of aorta with an intrathoracic stomach.

functioning esophagogastrostomy with an intra-thoracic stomach. The patient was then prepared for the next procedure of resection of the carcinoma of the sigmoid colon. The

blood work at this time revealed a red blood count of 4.3 million cells; hemoglobin of 92% —14.4 grams; hematocrit 48%; total proteins, 5.76 gm. %; albumin, 2.47 gm. %; globulin, 3.29 gm. %; urea nitrogen, 10 mg. %; and a negative urine. On June 10th, 1952 an anterior resection was performed and an end-to-end anastomosis carried out. There was no evidence at this time of local or distant metastasis. The postoperative course was uneventful and he was discharged home on a soft diet on June 27, 1952 weighing 109½ pounds. The pathological specimen, S52-25303, revealed an adenocarcinoma of the colon with extension into the muscularis and the seven lymph nodes in the mesentary were negative for tumor cells.

The patient was re-admitted from his home on July 5, 1952 because of a depressed state, refusing to eat and having diarrhea which began three days before. At this time he showed well healed incisions, marked dehydration, and mild pitting edema of both ankles. His blood work showed a red blood count of 4.1 million cells; hemoglobin, 83% —13 gms.; total proteins, 4.60 gm. %; and urine examination a two plus albumin with many white blood cells in the sediment. He was treated energetically with fluids, intranasal feedings, and a controlled diet. The diarrhea was impeded with paragoric and kaopectate. He continued to refuse feedings and became more unmanagable. On July 21, 1952 a Witzel jejunostomy was performed and feedings begun, but unfortunately the tube was pulled out and the patient continued to go downhill and expired on July 30, 1952. An autopsy was done, (A52-140), and examination of the operative sites revealed no gross or microscopic evidence of carcinoma. At the esophagogastrostomy a small superficial ulcer was present measuring one cm. in size. The heart was enlarged with evidence of failure. There was marked wasting of the entire body.

SUMMARY

This is a review of 15 cases of carcinoma of the esophagus which have occurred in the past six years at the Delaware Hospital, with the presentation of one patient with a double primary carcinoma of the gastro-intestinal tract.

The incidence, operability rate, resectability rate, and post-operative death rate of carcinoma of the esophagus were reviewed and shown to be very poor. Factors which would improve these rates were mentioned.

Education and encouragement of patients with dysphagia to seek early medical attention and the physician to be aware of this diagnosis were stressed. More use of the diagnostic aids of barium swallow and esophagoscopy were emphasized.

The technical means to resect carcinoma of the esophagus were elucidated and proven to be effective.

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RETROPERITONEAL LIPOSARCOMA
A Case Report

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In general, the histological study of adipose tissue has been neglected and fat, known to everyone and found extensively in the

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body, has been the subject of little research. Its functions are to isolate the body thermal changes and to serve as a storage reservoir of carbohydrates. It is concentrated in the internal parts of the body in the neighborhood of organs, especially the kidneys, the retroperitoneal area, the mesentery, and the omentum. The thigh, popliteal space, gluteal region and the mammary gland in women are a few of the less common sites of occurrence.

The majority of liposarcomas seem to develop in the later years of life—with a mean age of fifty years. However, they are encountered in children and one must be prepared to expect them at any age.

Adipose tissue is readily traumatized but the role that trauma plays in this tumor is felt to be a minor one. Sex does not predispose to liposarcoma, but of the cases reported in the literature, the male seems to predominate for no specific reason.

Liposarcoma can develop from pre-existing lipomas, but the large majority are malignant tumors from the beginning. They are noted for their variation and rate of growth, which is often very rapid and at other times, exceedingly slow. Between these extremes there are all grades of variation, but the greatest number exhibit slow growth and with a relatively small number spreading by metastates. The enormous size which they may obtain is illustrated by Delamatee's paper (quoted by Stout[7]) in which an enormous retroperitoneal lipoma, weighing at least 179 lbs. and possibly 275 lbs. was recorded. The spread by metastates is debatable and some feel that their cases were examples of multiple tumors, not metastatic in origin, as the tumors appeared simultaneously or successively in widely separated areas. This should not be interpreted as meaning that metastates never occur in cases of liposarcoma. They most certainly do! They metastasize less commonly than other types of sarcoma and are found most often in the lungs or pleura, liver, bone marrow and central nervous system, in this order.

The **Gross Characteristics** of liposarcoma are quite varied, but in general they form large, bulky, nodular, masses of encapsulated tissue which is always firmer than the adipose tissue of simple lipomas, but less firm than those of fibrosarcomas. They are usually yellow and opaque but run a gamut of colors from orange to pale cream. They may show a distinct tendency to break down and this causes extensive hemorrhage into its substance, or there may only be an increased vascularity. These tumors not infrequently have areas of normal fat interspersed among the sarcomatous masses.

The **Microscopic** picture of liposarcomas is even more varied than the gross and gives rise to a great variety of names which lead to confusion. The picture is usually mixed, consisting of islands of embryonic fat, adult fat, and myxomatous stroma and containing oat shaped cells containing fine granules of fat that are demonstrated only by appropriate fat stains. They show active growth and invasion. These cells may be of all sizes and shapes and show vacolization. The vacoles reveal lipoid content when stained with an appropriate fat stain. Giant cells are not unusual. Such microscopic studies lead us to look upon the liposarcomas, not as a group of separate and distinct tumor types, but as a simple group capable of different degrees of differentiation which can be described according to its predominent features, namely myeloid, adenoid or round cell, and mixed groups.

Diagnosis of any mass should be made, if possible, from the clinical history and physical examination, but a biopsy before treatment is the proper procedure. If they have reached a large size or if their growth is rapid, they should be suspected clinically and if at biopsy, they are bulky and yellow, liposarcoma is likely.

Treatment is surgical removal and wide resection is advised because of the ease of overlooking a nearby nodule. Some of the tumors are radio-sensitive and this therapy is most useful in treating small, recurrent nodules or a tumor which is in a small or inaccessible area. Some men advocated its use before surgery. The larger and the deeper the tumor, the more failures occur when treated with x-ray.

Prognosis is variable but, in general, the more cellular and less fat it contains, the more malignant it will be.

CASE REPORT

Del. Hosp. Case No. 196974. A twenty-three year old white woman entered the hospital complaining of a lump in the right side, associated with pain. One month prior to admission the patient began to experience pain in the right flank, which radiated anterioraly and downward to the right lower quadrant. This was accompanied by episodes of nausea and vomiting but with no relationship to food intake, urination or menstruation. There had been no change in color, amount or frequency of voiding. Bowel habits had been normal. There had been no weight loss, edema or jaundice.

Past History revealed the usual childhood diseases.

Menstrual History revealed a nulliparous patient with regular periods every twenty-eight days associated with the normal amount of flow and discomfort.

Physical examination revealed a well developed, well nourished, white female in no distress, alert and cooperative. The skin and mucous membranes were of normal color and were moist. Pulse, 78; blood pressure 160 systolic, 100 distolic; temperature 99. Lungs were clear to percussion and auscultation. Heart, regular rate and rhythm, no murmurs were audible. Sounds were of good quality. Examination of the abdomen revealed a soft, yet firm palpable mass which occupied the right upper quadrant and right flank. The surface felt smooth, moved with respirations, and was thought to be encapsulated and did not appear fixed. It extended to the midline and downward to the symphysis pubis on the right. The spleen and left kidney were not palpable.

Laboratory Data. Admission urinalysis revealed a straw-color, specific gravity 1.025, albumin one plus, sugar negative; WBC 2-4/hpf; RBC, 4-6/hpf; Kahn serological test, negative. Sed. rate, 31 mm./hr.; hematocrit, 45%; urea nitrogen, 136 mg.%; sugar, 89 mg.%. Blood count on admission revealed RBC of 4.5; WBC, 8,100; hemoglobin, 13 gm. (86.6%); urine culture was reported as non-hemolytic streptococcus and sensitive to penicillin, streptomycin, terramycin, chloromycetin and aureomycin. A smear of the urine was reported as revealing an occasional WBC, rare RBC and non-hemolytic strep. Roentgengrams of the heart and lung fields were normal. A barium enema was completed five days after admission and was reported as revealing no intrinsic lesion of the colon but displacement of the colon anteriorally on the right by an extensive abdominal mass.

On the day of admission an i. v. pyelogram was performed and this revealed a normal left kidney and ureter. On the right side there was an enlargement of the kidney and lower pole with obliteration of the psoas muscle and evidence of impaired function and a suggestion of upper displacement of the pelvis by the abdominal mass.

A cystoscopic and right pyelogram was done under satisfactory sodium penethol anesthesia and a No. 21 Brown-Buerger cystoscope was introduced without difficulty. The bladder appeared normal. Both ureteral orifices and trigone were normal. A No. 6 X-ray catheter was passed 27 cm. up the right ureter and obstruction was encountered and passed at the utero-pelvic junction. Thirty cc. of residual urine was obtained from the right kidney pelvis. Following this a retrograde pyelogram was done on the right side and was reported as revealing evidence of a moderate hydronephrosis with obstruction at the utero-pelvic junction. In addition, this kidney showed an enlargement of the lower pole, probably due to some tumor or cystic lesion with compression of the inferior borders. There was little motility of this kidney as seen in the erect position. There was a definite line of cleavage between the lower pole and the kidney itself and the right kidney was displaced upward and laterally. The left kidney as seen in the pyelogram was normal.

Six days following admission the patient was taken to the Operating Room and under satisfactory sodium penethol and inhalation anesthesia, a curve right flank incision was made exposing a large retroperitoneal tumor. The kidney was then exposed and the upper pole seemed to be entirely normal. The tumor mass was located adjacent to the lower pole of the right kidney and extended deep into the pelvis and towards the abdominal cavity.

The tumor was easily mobilized, and removed together with the kidney.

Pathological Report (Wilmington General Hospital, 3686). The gross specimen consisted of the right kidney and an adherent tumor mass measuring 12.0 x 10.0 x 7.0 cm. The kidney measured 12.0 x 7.0 x 5.0 cm. The surface was granular and the capsule stripped with difficulty. On cut section the cortex was swollen and pale. The renal calyces were dilated and the lining hemorrhagically discolored. The ureter showed evidence of chronic inflammation. Adherent to the posterior surface of the lower pole by a fibrous adhesion was a tumor mass which separated the kidney by a well defined line of cleavage. The kidney parenchyma in this area was compressed but showed no evidence of invasion by tumor. Sections through the tumor mass revealed a soft, necrotic, gelatinous stroma with areas of cystic degeneration and hemorrhage. The mass was partially encapsulated. Microscopic sections from the tumor showed interlacing spindle-shaped cells within a myxomatous stroma. The cells showed hyperchromatism and occasional mitotic figures. The kidneys showed no evidence of invasion by tumor tissue. Tubules were filled with a purulent exudate and the stroma revealed a collection of acute inflammatory cells with formation of micro abscesses.

Diagnosis: Myxo-sarcoma.

The patient made satisfactory progress without complications and was discharged fourteen days after her admission.

The patient was admitted to the Delaware Hospital four months later, on October 27, 1952 with recurrence of the mass in the right flank. Urinalysis, blood studies, and biochemical studies were within normal limits and similar to those on the previous admission. Roentengrams of chest were normal. A flat plate of the abdomen revealed an increased density overlying the right iliac crest which was approximately 10.0 cm. in diameter and it was suggested that a reoccurrence of the previously removed tumor had occurred. Four days after admission an exploratory laparotomy was performed under satisfactory sodium penethol and cyclopropane anethesia. At the operation a large metastatic nodule was found in the incision proper. This was removed along with the surrounding muscle tissue. On opening the peritoneum no intra-peritoneal metastases were found but the whole right flank and lateral gutter were filled with lumpy sarcomatous masses. After removing large, grapefruit sized masses, tumor tissue was found along the iliac vessels and underneath the liver as far as one could reach along the vena cava. Silver slips were used to show the limits of the tumor so that irradiation could be applied in case the tumor proved to be radio sensitive. Following an uneventful post-operative convalescence the patient was discharged from the hospital and instructed to return to the Tumor Clinic for radio-therapy.

The *pathological report* grossly revealed (S-52-26953) a tumor which was soft, gray red and tan, with a glistening, gelatinous, mucoid-like surface. Microscopic study revealed similar myxosarcomatous areas as seen previously, but in general, the tumor had changed, becoming more compact with wavy bundles of spindle shaped cells together with numerous bizarre multi nucleated giant cells and numerous small vacuolated cells, the latter with regular stains, presented a honeycombed, fine net like appearance and when stained for fat were strongly positive. The giant cells were also positive with special fat stains. The diagnosis was Liposarcoma.

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THE CLINICAL USE OF BONE MARROW ASPIRATION:

Its Limitations and Methods

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The use of bone marrow examination as a diagnostic aid has gained extensive recogni-

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tion in the past years. In some hospitals a marrow aspiration is almost a routine procedure for the patient admitted for diagnostic study, and some physicians have the impression that a marrow aspiration is absolutely necessary for an accurate diagnosis of anemia. The recent literature is filled with articles on the diagnosis of numerous clinical conditions simply by examining a smear of aspirated bone marrow and it is easy to understand how many clinicians have come to depend on bone marrow aspirations as the diagnostic answer to their clinical problem.

The limitations of diagnosis with bone marrow preparations must always be kept in mind by the clinician. Dr. Roy Kracke[20] states "It is well recognized now that a study of the marrow may permit diagnosis with certainty of some conditions, such as leukemia, multiple myeloma, carcinoma, Gaucher's disease, histoplasmosis, kala-azar, and malaria. While examination of the marrow has proved to be valuable when the findings are positive, negative findings are not conclusive. After careful study of the cellular content of the marrow with respect to both the type and quantity of cells, one may be able to recognize merely a state of the marrow rather than to diagnose a specific disease. Thus, it is often possible to say only that a marrow is hyperplastic with respect to erythroblastic tissue; or that it contains an undue number of megaloblasts which indicates a deficiency of the hematopoietic factor; or that it shows an increase in the myeloid-erythroid ratio without disturbance of the maturation cycle, which would indicate an infectious disease."

The same opinion regarding the excessive use of the bone marrow aspiration as a diagnostic technique is further expressed by Dr. Maxwell Wintrobe[19] who states "It is not often that one actually needs to examine the bone marrow to make a diagnosis of pernicious anemia; although, the marrow picture in that condition is always entertaining. Likewise, in the hemolytic anemias, one is likely to find only what one should have expected."

Techniques for the aspiration of marrow have become fairly well established now that suitable instruments have been devised for this purpose and are readily available. While bone marrow has been well studied by biopsy and trephine, the present simple method of obtaining it from the sternum was not introduced until 1929 by Arinkin[1]. His method of puncture of the sternum by a stilletted needle and the aspiration of a small amount of marrow, soon proved more convenient and adaptable than the formal surgical procedure. Many different methods and needles have been devised since that time to obtain marrow. In experienced hands almost any adequate stilletted needle will suffice. Of the many types of needles, the one devised by Klima and Rosegger in Germany in 1935 has been more popular. With minor adaption of the syringe hub it became known as the Klima-Schleicher Sternal Puncture Needle. Rheingold[13] recently described a simple 16 gauge needle with a shaft of 3.3 cm. which is quite similar to the Osgood B-D marrow needle that has been in use for some years. Recently Limarzi[9] introduced another modification of the Klima needle to improve the fit of the stylet and locking device and included a Luer-Lok hub. This needle, which is probably the best of those with a guard, is known as the University of Illinois Sternal Needle.*

As the sternum was the most apparently accessible site for red bone marrow, aspirations were first performed at the midline about the level of the second or third intercostal space in adults and in the manubrium in infants. Under strict asepsis and with local anesthesia this technique gradually became an office procedure.

Recent interest has focused on other sites for bone marrow puncture. Studies have indicated that marrow from the vertebrae, ribs, crest of the ilium, and from the heads of the tibia and femur offer adequate material [11, 17]. The advantages of the iliac crest puncture have been proposed[18, 14, 13] as offering greater safety, less patient apprehension and discomfort, and more convenient repetition. The procedure is similar to sternal puncture and the marrow is entered just distal to the crest of the ilium with any of the needles used for the sternal approach. Spinous process punctures were introduced as a clinical aid by the Heidenreichs in

*Available from V. Mueller Supply House, Chicago, Illinois.

1936[5] and more recently have been suggested[10, 6, 13] as a primary or alternative site. Loge[10] in performing spinous process punctures preferred the Klima-Schleicher needle to the Osgood B-D or similar type of needle because of the advantages in applying pressure and direction. He punctured the L3 or L4 process, whichever was the broadest, with his patient in a sitting position. Rheingold[13] recommends a face downward prone position so that needle pressure can be more readily applied and the patient lies in a relatively fixed and comfortable position. The advantages of a multiple choice for marrow puncture sites are apparent. Besides offering an alternative approach in an apprehensive patient it permits further confirmation of marrow findings in cases of potential focal involvement of the marrow.

PROCEDURE

The preparation of aspirated marrow is probably the most important step in performing a marrow aspiration, and when it is done improperly is most often responsible for poor results. Several different methods of obtaining smears have proven satisfactory. The most adequate method and one of the simplest is to aspirate a very small amount of marrow into a syringe, (0.1 to 0.2 c.c.) following which thin smears of the marrow are made immediately. This is followed by the aspiration of 3 to 5 c.c. of marrow into a second syringe whose contents are then discharged into a tube containing heparin.* This heparinized tube of marrow is centrifuged in a Wintrobe hematocrit tube and smears of concentrated marrow are made from the buffy layer obtained. Adequate staining of marrow smears is obtained by fixing with concentrated Wright's and staining with dilute Giemsa stains.

Differential counts of aspirated marrow are unnecessary and frequently misleading. Careful observation of the marrow pattern and cytology is usually sufficient. The wide range of reported normals for marrow nucleated cell counts per cubic millimeter likewise indicate that this step should be discarded as a routine procedure.

While examination of aspirated marrow smears has offered excellent cytological material, the greatest objection to the aspiration technique has been its failure to allow for histopathological study of bone marrow structure. Dr. Roy Kracke[20] emphasized this difficulty when he stated "Aspiration of material from the marrow presents all of the disadvantages of a specimen that is inadequate for biopsy." He further recommended that it is always preferrable to have a solid piece of tissue for pathologic diagnosis rather than cellular tissue in a liquid medium, since it is only through the study of solid tissue that the true architectural pattern can be discerned. The vast amount of accumulated knowledge and limitations of marrow changes in health and disease have been well presented in a recent monograph by Custer[21].

Berman[2] introduced an excellent technical modification for preparing histological sections of solid marrow particles in the aspirated marrow. With a few modifications this procedure is employed at the Delaware Hospital laboratory. Marrow which has been allowed to clot in the aspirating syringe is immediately immersed in fixative. Any marrow particles that are found adhering to the barrel of the syringe are carefully picked up and transferred to a drop of plasma with the aid of the pointed ends of split wood applicators. To this is added a minute amount of topical thrombin. The presence of thrombin causes clotting of the plasma, which includes the marrow particles. This clot is then transferred to a fixing solution and all material is then processed as in other tissue for histologic section.

Marrow interpretation should be made by one well trained in the field of hematology, but without related hematological studies it is often a wasted effort.

The well planned use of a marrow study can be a valuable diagnostic aid when preceded by a complete hematological study of the peripheral blood, history, physical findings and general clinical picture. Careful study of the hematology reports will often dismiss the need for marrow studies which is a procedure requiring experience and time. Often a smear of a buffy coat of centrifuged blood will offer more information than the

* 0.1-0.2 c.c. (2 mg.) Liquaemin (Organon brand of Sodium Salt Heparin).

marrow itself, particularly if the marrow smear is not representative.

However tempting it may be, marrow studies should not be run without careful analysis of the real benefit to be gained.

In the average hospital marrow studies offer little benefit in most of the anemias. With the leukemias, particularly the aleukemic variety, it is often very helpful. When coupled with marrow sections it is of diagnostic benefit in cases of pancytopenia. One always must be cautious in evaluating the pancytopenic condition from smears alone knowing that marrow can have patchy involvement and that the aspirate can be nonrepresentative.

In general the number of cases where marrow is a specific diagnostic aid are infrequent in the average hospital. With multiple myeloma, for example, no single examination offers more conclusive findings. However, such cases are uncommon.

With thoughtful approach and study and careful procedure using both smear and sections of marrow aspirate diagnostic benefit will be gained, while routine indiscriminate use will but classify this valuable aid as a fruitless gesture.

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THE OCCURRENCE OF MEMBERS OF THE TRIBE MIMEAE IN HUMAN INFECTIONS

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The increasing frequency of isolation of a heretofore unidentified group of gram-negative bacilli from clinical specimens has prompted this report.

REVIEW OF THE LITERATURE

De Bord[1], in 1939 described an organism isolated from normal and pathological vaginal and conjunctival secretions. He named the group *Mimeae* (Greek—to imitate) because of their similarity to the neisseria in their morphology and staining reaction. He subsequently described three genera[2], based primarily on their ability to attack carbohydrates: (1) *Mima polymorpha* (var. oxidans); (2) *Herellea vaginocola;* (3) *Colloides anoxydana.* Members of the tribe shared the following characteristics: pleomorphism, with diplococcal forms reverting to bacilli; a bipolar gram-negative stain; encapsulated initially with smooth, butyrous to mucoid colonies.

De Bord[3], in a study of 147 cases of conjunctivitis, vaginitis and normal secretions, pointed out that about 30% of the positive cultures, although indistinguishable morphologically from the gonococcus, were members of the tribe *Mimeae.* As a result of this investigation, he stated that identification of the gonococcus by smear alone was not justified.

Deacon[4], in 1945, reported the isolation of 19 strains of microorganisms which he identified as *Mimeae.* They were recovered from therapy-resistant gonorrhea, war wounds, cerebrospinal fluid and brain tissue following head injuries. A strain of *M. polymorpha* (var. oxidans) from a wound proved lethal to a guinea pig following intraperitoneal injection, and 9 strains of *H. vaginocola* killed guinea pigs injected intraperitoneally, but not subcutaneously.

De Bord[5] described a non-fatal case of meningitis from whose cerebrospinal fluid a gram-negative diplococcus resembling a men-

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ingococcus was isolated. The organism, identified as *M. polymorpha*, was pathogenic for mice when injected intraperitoneally. The patient recovered following sulfonamide therapy.

In 1948 Schaub and Hauber[6] reported the recovery of 15 identical gram-negative bacilli (the majority from urine), which had been submitted for identification. A comprehensive study, including biochemical and serological tests, revealed a previously undescribed species, for which the authors proposed the name *Bact. anitratum*. The organisms were pathogenic for mice and guinea pigs injected intraperitoneally. Ewing[7] in 1949 demonstrated the relationship of *Bact. anitratum* to De Bord's *Herellea*, and suggested it be classified as a member of the *Mimeae*. His study also indicated several serotypes based on capsular and somatic antigens.

Faust and Hood[8] reported a fatal case of fulminating septicemia, whose admission blood culture revealed a neisseria-like organism. This was subsequently identified by biochemical and serological methods as *M. polymorpha* (var. oxydans). Pike and others,[9] reported the isolation of *M. polymorpha* from a child with subacute bacterial endocarditis following cardiac surgery. Two blood cultures and one bone marrow culture were positive for this organism one and one half years after operation. It was sensitive *in vitro* to terramycin, and the patient was treated with this antibiotic. Five subsequent blood cultures showed no growth, and the patient remained afebrile and asymptomatic in the ensuing four months.

Source of Cultures

In the past year 24 strains of *Mimeae* have been isolated in our laboratories from a variety of clinical specimens. Half of these were recovered from females, and the overall age group ranged from a newborn infant to an 82 year old male patient. The organisms were isolated most frequently from the urinary tract (10) and upper respiratory tract (7), including bronchial secretions. They were also found frequently in conjunction with other pathogens from the conjunctiva and ears. Only one blood culture (a newborn with an unexplained fever postpartum) was positive for *Mimeae*, probably representing a transient bacteremia.

Cultural Characteristics

Our interest in this group of microorganisms was originally stimulated by Dr. Martha K. Ward, in charge of the Special Bacteriology Laboratory, Communicable Disease Center, United States Public Health Service. Dr. Ward has confirmed the biochemical reactions on all of our strains, and has carried out serological identifications on all the strains.

Twenty-three of the twenty-four cultures exhibited similar biochemical characteristics, and were classified into De Bord's *Herellea* group. All strains produced an alkaline slant and neutral butt on triple sugar iron agar, and characteristic coliform-like colonies on blood agar plates, with varying degrees of pigmentation and hemolysis. A typical odor, not unlike seminal fluid, was apparent on blood agar. The group was most frequently confused with pseudomonads and *Alcaligenes* species, but produced no green water-soluble pigment, and uniformly fermented dextrose and xylose, with acid production only. Most strains failed to reduce nitrates or hydrolyse urea, and all strains were nonmotile. Citrate was uniformly utilized and indol was not formed.

The susceptibility to antibiotics, as determined by *in vitro* disc testing revealed a uniform pattern. The majority of strains were sensitive to aureomycin and terramycin, but resistant to chloromycetin and streptomycin. When resistance to aureomycin and terramycin were demonstrated, resistance to chloromycetin and streptomycin invariably followed. Insufficient data on sensitivities to polymyxin and neomycin were accumulated. All strains were resistant to penicillin.

Discussion

Although De Bord's original work points out the importance of distinguishing *Mimeae* from gonococci, it becomes apparent that the *Herellea* group are more frequently isolated, and less likely to be confused. Ward[10] has indicated that "by far, the greatest percentage of strains we have received for reference diagnosis fall into the group that De Bord called *Herellea*."

The role of members of the tribe *Mimeae* as etiological agents in human infections gives rise to some speculation. At this writing, no one has reported on their natural habitat or possible method of transfer. Are they merely ubiquitous opportunists, with a predilection for the urinary tract or upper respiratory passages? Have they emerged as a result of antibiotic therapy primarily directed (as with penicillin) against pyogenic cocci? It becomes rhetorical to state that these and other questions can only be answered by further investigative studies.

SUMMARY

1. The occurrence of members of DeBord's *Mimeae*, a group of gram-negative bacilli is reported.
2. The source of these organisms, their cultural characteristics and their *in vitro* sensitivities to antibiotics is presented.

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CLINICOPATHOLOGIC CASE REPORT

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PRESENTATION OF CASE***

The patient, a 49 year old colored male, was first admitted to the Delaware Hospital on 2/17/50 with the chief complaint of swollen ankles. Patient claimed to have been in usual state of good health until approximately 3 weeks prior to admission when ankle edema developed. The edema became progressively more severe and scrotal edema occurred and had become progressively worse. Patient also states he has had slight shortness of breath on exertion. He also complained of a slight cough productive of whitish sputum. Patient was a bricklayer and had continued working until admission to hospital. Patient also states that the edema had progressed upward involving legs first, then genitalia, and then abdomen. Past Medical History: revealed that the patient had been treated for syphilis in 1940. He had no operations. Systemic Review: Head; normal. Cardiorespiratory system: normal. G. I. system: occasionally there is right upper quadrant pain, with present illness. G. U. system: normal. Endocrine system: normal. Physical Examination: Blood pressure 180/116; pulse 72. The patient is a well developed, well nourished negro male in no acute distress. Head: Eyes, pupils round and equal, react to light and accommodation. Fundi: moderate sclerosis of retinal vessels; pallor of retinae, and A V nicking. No hemorrhage, exudates or papilledema. Ears, Nose & Throat: mucous membranes of a normal color, moist non-inflammed. Nose is normal. Ears are normal. Neck—slight mandibular adenopathy. Thyroid is palpable low down in sternal notch. Trachea in midline. Chest: Lungs—breath sounds diminished to absent at right base especially postero-laterally. Breath sounds at left base diminished posteriorly. No definite rales were heard. There is dullness to percussion at the right base. Tactile fremitis absent at the right base and diminished at the left base. Heart: rhythm irregular, apparently due to auricular fibrillation. No definite murmurs heard. Heart size appoximately normal. No thrills palpated. Abdomen: slightly taut and fluid wave demonstrated. Liver: not palpable. No other organs or masses felt. There is moderate right upper quadrant tenderness. Genitalia: moderate penile edema and tremendous edema of scrotum. Extremities: four plus pitting edema of both lower extremities.

Laboratory Studies: Hgb. 86%, 13.5 gms. WBC 5,400; polys seg 63%; lymphs 24%; eosinophiles 11%; BUN 20 mg.%; serum cholesterol 376 mg.%; Wassermann, plus 4. Urinalysis: sp. gravity 1.004; reaction—alk.; albumin plus 1; sugar and acetone negative; occasional WBC/hpf; occasional hyaline cast per hpf; occasional squamous epithelial cells. Chest x-ray taken at time of admission showed a heart shadow within normal limits with some slight engorgement of the vascular shadows of the hilar regions of the lungs and

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some pleural effusion at the right base obliterating the right cardiophrenic angle.

Patient was treated while in the hospital with digitoxin, thiomerin and ammonium chloride. EKG showed marked respiratory arrhythmia with moderate bradycardia. The tracing was otherwise normal. Patient did well; edema subsided and by 2/24/50 he became asymptomatic. Blood pressure while in the hospital varied from 140/100 to 150/110 to 130/80. On discharge blood pressure was recorded at 110/80. Patient was discharged on digitalis maintenance therapy, mercurial diuretics and referred to Medical Clinic for follow-up and to GU Clinic for antiluetic therapy.

Patient's second admission to hospital was on 12/28/50 when he was admitted with shortness of breath and pain in chest. The night previous to admission he was seen in the Emergency Department and given a morphine injection. Apparently he did well for a few hours but then developed a "tremor like seizure and felt badly." He then became progressively worse and was admitted to the hospital.

Physical Examination: revealed a negro male who was in acute distress. Breathing was labored and patient was semicomatose, tossing about quite energetically. Blood pressure 168/94; pulse 120 and regular. Temperature 98° (F). Head normal. Face—on the left side is flattened and there is a blowing out of left cheek with each expiratory phase, which is not present on the right side. Eyes normal. Ears normal. Nose normal. Mouth normal. Neck questionable nuchal rigidity. There is venous distention. Trachea is in the midline. Chest—equal expansion bilaterally. Percussion note is dull in the lower bases bilaterally. Numerous rales throughout both lung fields. Heart: point of maximum impulse to the left of midclavicular line. No thrills or shocks palpable. Heart does not appear enlarged to percussion. Heart sounds are regular and strong. Tachycardia is present. Liver is questionably palpable 1-2 fingers below the costal cage. Genitalia: normal male. Extremities: There is hyperreflexia of all four extremities. No pathologic reflexes present. Some beginning flaccidity of left arm. There is two plus pitting edema of ankles.

Patient was treated with an indwelling catheter, digitalis leaf and crystacillin. Hexavitamins and gelusil were also used. During hospitalization patient was a fluid balance problem. BUN was elevated and the CO^2 decreased. Renal output was poor. He was treated with intravenous fluids varying from glucose in water to 1/6 M. lactate in order to correct electrolyte balance. On 1/16/51 patient was reported to be passing bright red blood by rectum. He appeared to have passed several cc. Examination failed to reveal bleeding point. Blood pressure 110/80; pulse 110. Patient complained of rectal pain. Abdomen was soft with normal peristalsis. On 1/27/51 patient began vomiting and respirations became labored; feces at that time were noted to be tarry. Patient expired uneventfully at this time.

Laboratory Studies EKG: 1/3/51 showed sinus tachycardia with ST changes of a non specific nature. No evidence of old or recent myocardial infarction noted. The pattern could represent functional coronary insufficiency. 1/15/51 EKG showed changes consistent with digitalis effect were present. 1/24/51 EKG showed improvement with erection of T waves in chest leads and limb leads. There is evidence of potassium intoxication. Hematology: 12/29/50-RBC 2.3; Hgb. 48%, 7.6 gm.; WBC 10,300; polys seg 80%; lymphs 15%. 1/10/51 RBC 2.2; Hgb 41%, 6.4 gm.; WBC 17,800; Polys seg 56%; nonsegs 24%; lymphs 18%. Toxic degeneration marked. Chemistry: 12/29/50 — sugar 71 mg.%; BUN 98%; phosphorous 6.9 mg.%; calcium 12 mg.%. 1/3/51—BUN 155 mg.%; creatinine 9 mg.%; chlorides 750 mg.%; CO^2 11 vol.%; potassium 5.2 mEq/L; sodium 157 mEq/L 1/8/51—BUN 234 mg.%; chlorides 640 mg.%; CO^2 19 vol.%. 1/9/51 potassium 5.1 mEq/L; sodium 150 mEq/L 1/11/51—BUN 300 mg.%; creatinine 11 mg.%; plasma chlorides 660 mg.%; phosphorous 11.3 mg.%; 1/13/51—BUN 440 mg.%; total serum protein 5.14 gm.%; albumin 1.89 gm.%; globulin 3.25 gm.%. 1/15/51—BUN 400 mg.%; plasma chlorides 600 mg.%; CO^2 28 vol.%; phosphorous 10.3 mg.%; potassium 5 mEq/L; sodium 130 mEq/L 1/21/51—Sodium 142 mEq/L; postassium 6.8 mEq/L 1/27/51—BUN 515 mg.%; serum chlorides

540 mg.%; CO^2 43 vol.%; potassium 5.4 mEq/L; sodium 130 mEq/L 12/29/50 — spinal fluid clear, colorless, and less than one white blood cell per cubic millimeter. Serology: 1/13/51—Mazzini—negative. Bacteriology: 1/13/51—spinal fluid: stained sediment negative. Culture no growth. 1/13/51—urine culture negative for enteric pathogens. 12/29/50—Blood culture—no growth aerobic or anaerobically. 1/24/51—urine chlorides 10.7 gm. per 24 hours. Patient was given 1500 cc. of washed red blood cells during hospitalization. Stool: 1/15/51 — benzidine plus four; guaiac test positive. Urinalysis: 12/28/50—specific gravity: 1.010; reaction acid; albumin plus three; sugar negative; acetone negative; RBC 10-20; WBC 10-30. 1/8/51 — specific gravity: 1.001; reaction alkaline; albumin plus four; sugar negative; acetone negative; RBC occasional; WBC 8-10; crystals, numerous triple phosphates. 1/26/51—specific gravity: 1.010; reaction alkaline; albumin plus four; sugar negative; acetone negative; WBC few.

DIFFERENTIAL DIAGNOSIS

Dr. Eugene F. Milewski: On first consideration of the initial admission, the primary picture appears to be one of the cardiac insufficiency with secondary renal involvement; However, further study reveals abscence of cardiomegaly, no EKG changes, a bradycardia and no evidence of hepatomegaly or actual pulmonary congestion. The distribution of edema seems to be of renal rather than cardiac nature. We know that renal pathology can also produce the picture above (edema, effusion, elevated BUN, albuminuria, etc.) and the elevated cholesterol also favors primary renal disease. Sufficient data however is not available to differentiate the etiology.

Eosinophilia is not readily explained and since there was only one reported blood count, too much importance can not be attached to this finding; however, lupus erythematosus, periarteritis nodosa and other causes of increased eosinophiles were ruled out on the absence of skin rash, leukocytosis, and other substantiating data necessary.

On the second admission we have a patient in obvious terminal status exhibiting the classical signs of advanced uremia, namely, hypertension, anemia, edema, urine of fixed specific gravity, albuminuria, hematuria, elevated BUN, hyperphosphatemia and acidosis. The central nervous system involvement can probably be explained on the basis of uremia, but we find no mention of any persistence of neurological findings throughout the hospital stay, which we should expect if this were cerebral hemorrhage due to uremia; therefore, I shall assume this patient had had a cerebrovascular thrombosis on admission which cleared during hospitalization.

Since our primary concern is the renal disease process I have considered several entities which terminally produce the uremic syndrome. To establish the diagnosis of arteriolar nephrosclerosis secondary to malignant hypertension we should expect a long standing history of hypertension of much higher levels than those reported above, a tremendous cardiac hypertrophy and a far advanced retinopathy.

Bilateral hydronephrosis was next entertained as a possibility but, without an abdominal mass, history of fever, chills or colicy pain, this enity is an unlikely cause of our patient's uremia.

The third disease process, which is probably most difficult to rule out and especially so in the terminal phases of renal disease, is bilateral pyelonephritis. In spite of the positive urine culture on one occasion we have no history of an acute attack with recurrences, no evidence of fever and chills, no lumbar pain or CVA tenderness, and therefore we can only consider this entity a possibility.

Chronic glomerulonephritis in its terminal stage produces a similar picture of uremia to the above, and there are several findings here in favor of this diagnosis, namely the decrease in total proteins and albumin fraction and the transient hypertension. In retrospect considering the initial admission as a nephrotic phase of glomerulo-nephritis progressing into the latent stage, I feel that this is the entity responsible for the terminal uremia.

In conclusion we must decide if the gastrointestinal hemorrhage was due to uremia or other gastrointestinal pathology. The findings of RUQ pain and tenderness, hematemesis and melena should in all cases be con-

sidered peptic ulcer until proved otherwise since this is the most frequent source of bleeding from the upper G. I. tract, the incidence ranging from 60 to 75%. The lack of response to transfusion would also favor hemorrhage due to intrinsic pathology rather than anemia due to bone marrow suppression in uremia. Statistically, without further studies available for a definite diagnosis, we must consider the possibility of a bleeding duodenal ulcer as a contributing factor to the anemia, uremia and final demise.

Summarizing the discussion, it is my impression that this patient entered the hospital in the nephrotic stage of glomerulonephritis, passed into the latent stage for the interim, returning approximately 10 months later in the terminal status of uremia due to chronic glomerulonephritis with an associated cardiac insufficiency, a cerebrovascular thrombosis and bleeding duodenal ulcer.

CLINICAL DIAGNOSIS

1. Uremia
2. Chronic Glomerulonephritis
3. Duodenal Ulcer
4. Cerebrovascular Thrombosis

PATHOLOGICAL DISCUSSION

Dr. Huntington: Participation in the discussion by those physicians present at the conference resulted in the following list of diagnoses for the cause of death: Chronic glomerulonephritis; Duodenal ulcer; Cardiac insufficiency; Cerebral Vascular accident; Nephrotic syndrome with terminal uremia; Arteriolar nephrosclerosis; Periarteritis nodosa; Polycystic kidneys; Lupus erythematosis disseminata; Syphilis (Hepar lobatum, Cerebrospinal, Renal); Tuberculosis; Multiple myeloma; and Hyperparathyroidism.

Autopsy Findings. The most dramatic findings were in the abdomen. The peritoneal cavity contained 3000 c.c. of thick yellow creamy exudate. The peritoneal surface was not inflamed or injected. The source of this exudate was apparently a duodenal ulcer located three centimeters below the pylorus. It measured 2.5 by 1.7 cm. and was undermining and had rolled edges. The base was on the pancreas and contained numerous organized thrombi. The posterior portion, adjacent to the liver, showed a minute perforation. The lesion proved to be benign on microscopic examination. There was also much organized old and new blood throughout the gastrointestinal tract. The heart was dilated both on the right and left side and showed evidence of myocardial degeneration. The lungs were edematous throughout all lobes. The kidneys were of normal weight, but appeared rather pale grossly. The microscopic findings were typical of a chronic glomerulonephritis. Postmortem spinal fluid chemistries showed a urea nitrogen of 425 mg.% and a carbon dioxide combining power of 14 volumes per cent.

PATHOLOGICAL DIAGNOSIS

1. *Uremia*
2. *Chronic glomerulonephritis*
3. *Duodenal ulcer with perforation*

BOOK REVIEW

Modern Drug Encylopedia and Therapeutic Index. Edited by Marion E. Howard, M. D. Fifth edition. Pp. 1431. Cloth. Price, $15.00. New York: Drug Publications, Incorporated, 1952.

This new edition of Modern Drug Encylopedia appears only two years after the Fourth Edition, which indicates the rapid changes taking place in this field of publication. The volume deals with 3750 drugs, nearly 1500 of them brand new listings and saves hours of time in check-up on the latest out-put of America's leading 175 manufacturers. For medical authors and editors the work is particularly valuable in that it differentiates immediately the official drugs from the newer drugs which have registered trade marks and which should be differentiated either by the use of a capital letter or the small capital R in a circle. In fact, this editor has found this volume indespensable and refers to it oftener than he does to the U.S.P. or N.F. The data concerning each drug is complete, including its chemical composition, action, uses, supply, dosage, cautions, and contra-indications. Finally, the book concludes with a therapeutic index, generic index, manufacturers and distributors index, and a general index, these four indices totaling 216 pages.

With the purchase of this volume goes a quarterly cumulative supplement entitled Modern Drugs, which will be supplied free until the next edition appears. The volume, with the supplement, is one that can be wholeheartedly recommended to the profession; certainly every hospital and medical library should have it.

+ Editorials +

DELAWARE STATE MEDICAL JOURNAL

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DUES FOR 1953

Annual dues of members of the Medical Society of Delaware are payable January 1, 1953, and the deadline for such payment is April 30, 1953. Dues remain at $25.00 per year. Dues for membership acquired after April 30 will be $12.50. Payment is waived in the following classifications:

1. Honorary Members—Those who have attained the age of 70 years and who have been in good standing in their County and State societies for 30 or more years. This exemptions begins on the January 1st after they have attained the age of 70 years.

2. Military Members—Those who are called to active duty with the Armed Forces of the United States. Such members shall pay the dues for the year in which they are inducted into service, but shall not pay the dues for the year in which they are mustered out. This exemption does not apply to "career" men.

3. Retired Members—Those who have retired from the practice of medicine and who *derive no part of their income* from the practice of medicine. Notice of bona fide retirement should be sent by the County Society Secretary to the State Society Secretary.

4. Hardship Cases—Those for whom the payment of dues would constitute a financial hardship, as determined by their local County society. Notice of such cases should be sent by the County Secretary to the State Secretary.

Members in these classifications will receive the Delaware State Medical Journal without charge. Our state treasurer cannot accept dues directly from members; payment should be made to the County Treasurer, who will remit to the State Treasurer on the 10th of each month.

AMA dues are due January 1, and the deadline for such payment is June 1. AMA dues for 1953 also remain at $25.00 per year. Dues for membership acquired after July 1 will be $12.50. The AMA will not accept remittances directly from members, and all such dues should be paid to the County Treasurer for transmittal to the State Treasurer and through him to the AMA. AMA dues are waived in the following classifications:

1. Age 70 years. Requests should be made *by the members directly* to the AMA. Exemption begins as in Item 1, above. Members thus exempted will not receive the JAMA unless the regular subscription price of $15.00 is remitted directly to Chicago.

2. Military service. Members called into active service with the Armed Forces of the United States, and exemption begins on January 1 or July 1 following entrance on active duty.

3. Retired Members. Under same regulations as in Item 3, above.

4. Hardship Cases. Under same regulations as in Item 4, above.

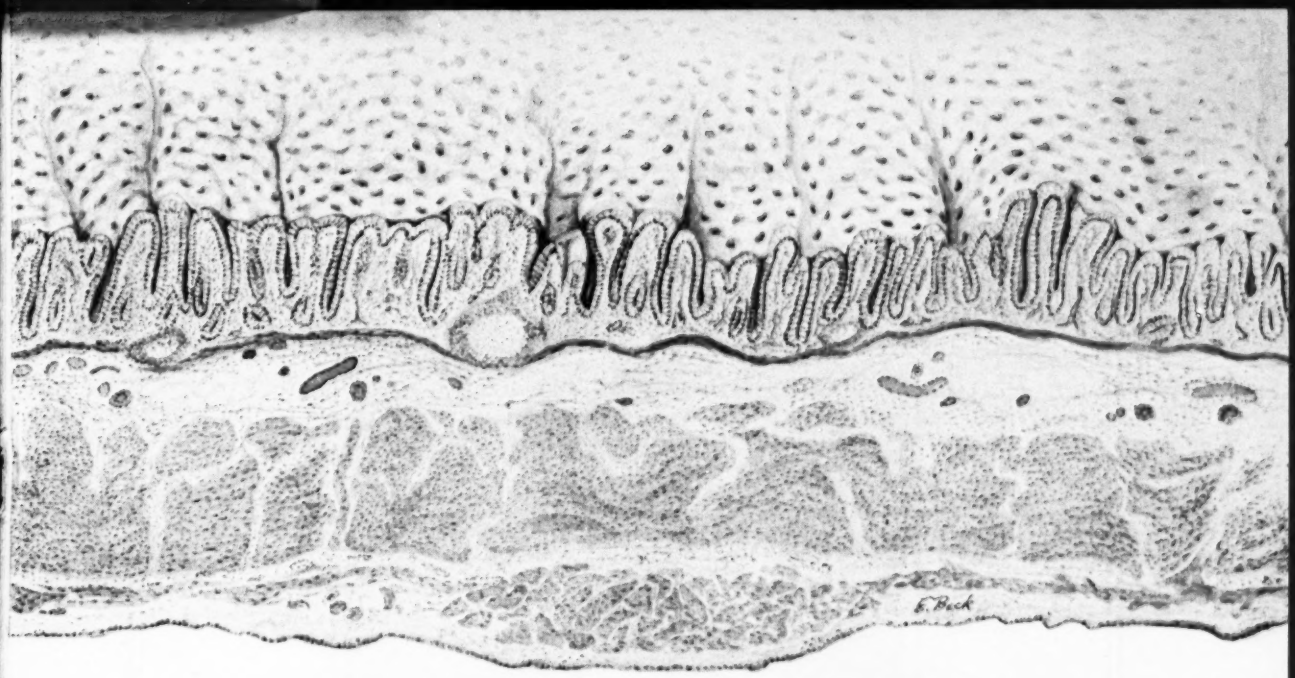
Further discussion of the AMA dues will be found in THE JOURNAL for January, 1952, page 33.

County Society dues remain as heretofore: New Castle, $10.00; Kent, $5.00; Sussex, $10.00. County dues are payable January 1, and the deadline for such payments is April 30.

Prompt and strict observance of the above regulations will make much easier the task of the officers of the County, State, and National Societies. Your status as a "good" member is more important than you may realize. We bespeak your thoughtful cooperation.

DIRECTORIES

Complete State, County, and miscellaneous directories will be published in the February issue. Cut out that page and keep it—you will find it useful.



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While these may not *always* mean cancer, any one of them should mean a visit to your doctor.
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For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

MAN ALIVE! is the story of Ed Parmalee, whose fear weakens his judgment. He uses denial, sarcasm and anger in a delightful fashion to avoid having his car properly serviced and to avoid going to a doctor to have a symptom checked that may mean cancer. He finally learns what a difference it makes (in his peace of mind and in his disposition) to know how he can best guard himself and his family against death from cancer.

For routine infant feeding. The basic Dextri-Maltose product.

Dextri-Maltose

MEAD

MEAD JOHNSON & COMPANY
Evansville 21, Ind., U.S.A.

Especially indicated for premature infants. Contains 50 mg. ascorbic acid per ounce.

To aid in counteracting constipation. Contains 3% potassium bicarbonate.

designed with singleness of purpose

Designed and manufactured specifically for infant formulas, Dextri-Maltose® has an unequaled background of successful clinical use. Safety for your infant patients is assured by the dry form of this carbohydrate, meticulous laboratory control at all stages in its manufacture, and hermetically sealed, key-opening cans. Dextri-Maltose is palatable but not sweet; does not create a "sweet tooth" in infants. Easily measured without spilling or waste and almost instantly soluble, Dextri-Maltose is convenient for the mother.